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U.S. Department
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United States
Coast Guard

THE SKIPPERS COURSE

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INTRODUCTION

THIS is a self-instructional program and might be a little different from other courses you're used to. Here's how it works. The subject material is broken up into short sections called frames. In a frame, we will ask you to read and absorb a fairly small amount of information. Then, to make sure you have learned and remember it, we'll stop and ask you to answer some questions in a Quick Quiz. The answers to these Quick Quizzes are in the back of the book, so you can check your answers immediately. If you gave any wrong answers, be sure to review the material before continuing. You can work at your own pace and may stop at any time for a break. Now, find a comfortable, well-lighted, and quiet place to work. Then turn the page and begin.

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PART 1, PRELUDE TO BOATING

A. Overview

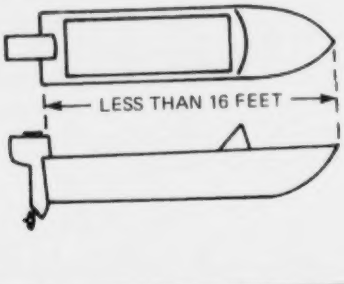
So you're going to be a Skipper? Then welcome to the group of some of the nicest people you'll ever meet. In the past few years, recreational boating has undergone an enormous growth in the number of boats on the water and the number of people who participate (recently estimated at more than 61 million). Our waterways are becoming increasingly crowded, and Skippers who are careless or ignorant of the Rules of the Road are a danger to themselves and other boaters.

To protect such people, and innocent bystanders, the Federal government, the states, and some communities have laws and regulations designed to keep recreational boating a safe sport. Much of what you need to learn is based on these *legal requirements*. The program begins with this subject. Do not try to go too far at first. You may take a break anytime. Each topic is immediately followed by a QUICK QUIZ so that you can see how well you are learning. Be careful to compare your answers with those given at the end of this manual. In this way you will complete the program at your own speed and with full success.

B. Classes of Boats

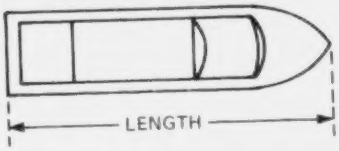
Remember back when you were responsible for your first car? If you do, you'll recall that your first concern might well have been the legal requirements. That is, the registration certificate, number plates, and possible inspection for all safety equipment. With boats it is very nearly the same thing. Your first concern is the legal requirements. There are both federal and state requirements. The state requirements vary from state to state. We will cover only the federal requirements. See Appendix 5 for where to obtain boating information in your state.

Many of the things that you must do and the types and amount of equipment you must carry on your boat are determined by one simple factor, the CLASS of your boat. The class is determined by the overall boat length. Shown below is a sketch of a small, open, outboard motorboat.

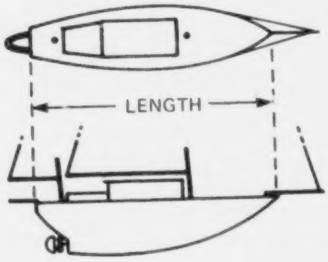


As you can see the outboard motor is NOT included in the measurement. If a boat (like the one shown in the sketch) is less than 16 feet it is said to be a class A boat. The equipment required for a class A boat will differ from that of other classes of boats. If the overall length of this boat is between *16 feet* but less than *26 feet* it is a class 1 boat. As before, the overall length is taken from the tip of the bow in a straight line to the stern (back) of the boat.

This is a sketch of an open-day cruiser.



The next sketch is an outline of an auxiliary sailboat with an engine and sails. This sketch was chosen to give you examples of attachments *not* included in the overall length to determine class.



If this boat's overall length is between 26 and 40 feet, it is a class 2 boat. The short piece of spar attached to the bow, the bowsprit, and the attachment on the stern with the odd name of bumpkin are not included in the overall length.

When the overall length of a boat is between 40 and 65 feet, it is a class 3 boat.

You will need to remember the four classes of motorboats, how a class is determined, and the lengths for each class. To help you remember, fill in the table below.

Class A = less than ____ feet.
Class 1 = ____ feet to less than ____ feet.
Class 2 = ____ feet to less than ____ feet.
Class 3 = ____ feet to not more than ____ feet.

QUICK QUIZ: Classes of boats

Try these questions without looking back.

1. Motorboats are divided into ____ classes.

2. The classes of motorboats are:

____

____

____

____

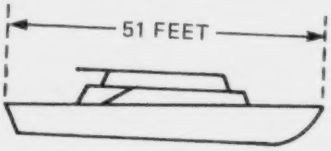
3. What is the only determining factor for the class of a motorboat?

____

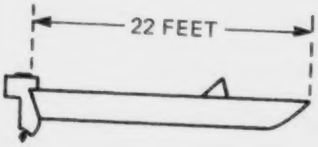
4. List all the classes of motorboats and their determining factor.

Class ____ is less than ____ feet.
Class ____ is ____ feet to less than ____ feet.
Class ____ is ____ feet to less than ____ feet.
Class ____ is ____ feet to not more than ____ feet.

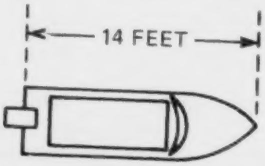
5. Shown below are some familiar sketches of boats with different lengths. Using the lengths, fill the class of each boat in the appropriate blanks.



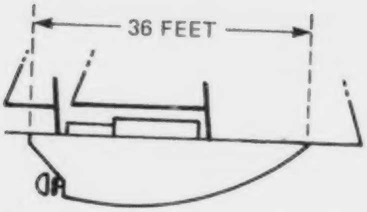
CLASS ____



CLASS ____



CLASS ____

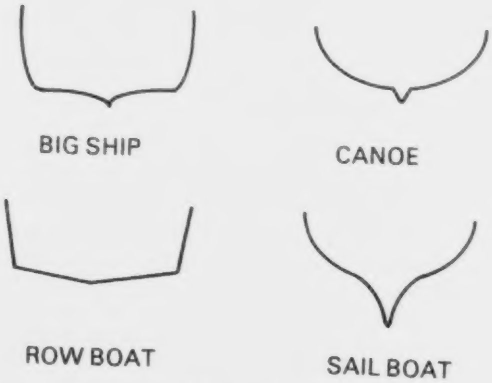


CLASS ____

C. BOAT HULLS

There are many different types of boat hulls, displacement hulls, planing hulls, hydrofoils, catamarans, hovercraft, etc., but generally speaking all boats and ships can be broken down by the way the boat is supported.

Boats are supported by the water that they displace. In other words, they **float!** Boats designed to be supported this way are called **displacement hulls** and include rowboats, sailboats, all big ships, trawlers, canoes, and kayaks. Figure (A.) shows the cross-section of the hulls of several displacement type hulls.



BIG SHIP CANOE

ROW BOAT SAIL BOAT

FIGURE A
DISPLACEMENT TYPE HULLS

Small high speed motorboats often move through the water fast enough so that the pressure of the water against the bottom of the hull provides some support. Boats designed to operate like this are called **planing hulls**. When a planing hull is not moving it is supported by the water it displaces (like a displacement hull). As it begins to move faster and faster a larger percentage of its weight is supported by the pressure of the water against the bottom, much like a flat stone skipping along the surface.

The ideal shape for efficient planing is a flat bottom but this is often hard to steer and pounds heavily in rough water. To make better planing hulls the designers have come up with many variations such as the deep V, concave bottom sections fig (B.), convex bottom sections fig (C.), soft chine, and flat bottom fig (D.).

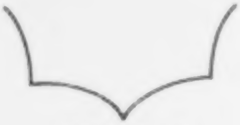


FIGURE B
CONCAVE BOTTOM PLANING HULL

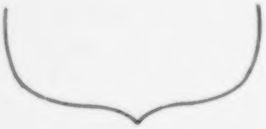


FIGURE C
CONVEX BOTTOM PLANING HULL

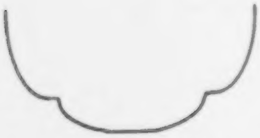


FIGURE D
SOFT CHINE FLAT BOTTOM
PLANING HULL

Some planing boats are fast enough so that the amount of bottom surface needed to support the boat at speed is small enough to be contained in several small skis or foils. These boats are referred to as **hydrofoils**.

And there are a few boats which travel fast enough so the effect of the air pressure against the hull provides support. The big racing hydroplanes are a good example of this type.

Think of it as a seaplane taking off. When it is stopped and taking on passengers it is a displacement craft. As it begins to move through the water it becomes a planing craft and as speed further increases the aerodynamic forces become great enough and it begins to fly, supported solely by the air.

There is another type of vessel that is supported by air, the **hovercraft**. In this case large fans create an air bubble under the hull which supports the weight of the craft.

Although these are all of the basic types, there are other interesting variations. Some boats have two hulls and are called **catamarans** and others three hulls and are called **trimarans**. A high speed catamaran currently popular is called a tunnel hull. The designers are always coming up with new combinations.

QUICK QUIZ: Boat hulls

1. Boats that move through the water have ______________ hulls.

2. A ______________ type hull is a variation of the planing hull.

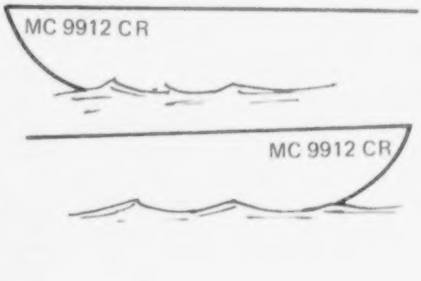
D. Legal Requirements

1. Numbering.

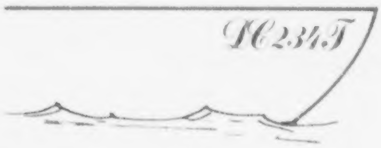
The rule for numbering boats is quite simple. All undocumented vessels equipped with propulsion machinery must be numbered. A motorboat is numbered for the same reason that your car is numbered—to identify it. Boats are registered and numbered in much the same manner that a car is registered. Obtain the proper forms from your state boating authorities (see Appendix 5). Complete and return them with the appropriate fee, then a Certificate of Number will be issued. These numbers must be put on the bow of your boat in a certain way. For example, suppose you were from the state of Michigan. Your assigned number might look like this:

MC 9912 CR

These numbers and letters must be painted or permanently attached to the forward half of the boat. They must be in block characters, in a color that contrasts with the background, and not less than *three* inches in height. Paint or mount them on both sides of the bow so that they look like this:

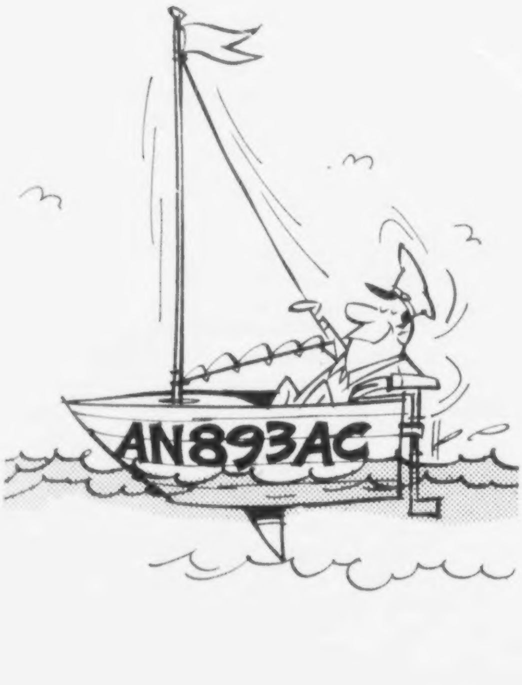


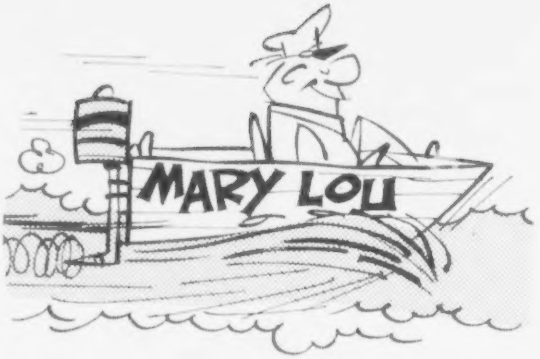
Make sure you leave a space between the first letters and the numbers that follow as well as between the numbers and the last letters. The space should be about the size of the letter "M". Don't use fancy lettering like this:



It's too hard to read and will not be accepted by either the Coast Guard or state boating officials. You will also receive a small wallet-sized card which is your Certificate of Number. Don't forget to carry it or have it aboard anytime you are using the boat. That's normally the first thing a Marine Law Enforcement Officer will want to see.

If you sell or transfer your boat you have to turn in your Certificate of Number. A new Certificate of Number will be issued to the new owner.



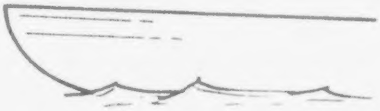


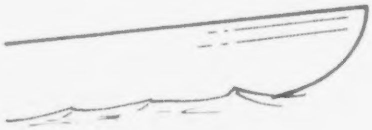
QUICK QUIZ: Numbering

1. Here is an imaginary boat number:

   AN8934AC

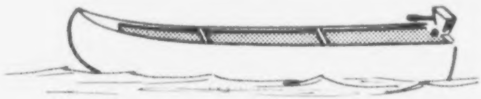
   Print these numbers on both the right and left side of the bow of the boat shown below the way you think it should be done.





2. Shown below is a sketch of a boat. This boat must be numbered.

   True ☐ False ☐



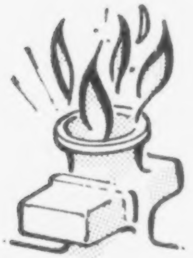
3. If you are ever stopped and boarded by a Marine law enforcement officer what is normally the first thing they will want to see?

2. Equipment

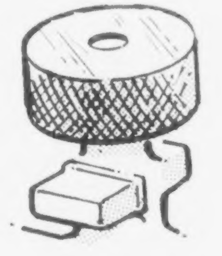
OK, then...the first thing to do is to get the boat properly numbered. Next you'll need to furnish the boat with the proper equipment so that it can be legally operated on the water. The law requires certain *minimum* equipment in the boat. That equipment depends upon the class of your boat. Let's consider each piece of equipment individually.

Back-fire Flame Arrester

If your boat has a gasoline INBOARD or INBOARD-OUTBOARD engine, it must be equipped with an acceptable means of backfire flame control. This usually means that you will need a Coast Guard approved flame arrester on the carburetor. If you have an OUTBOARD engine, a flame arrester is not required.



THIS MIGHT HAPPEN WITHOUT THE FLAME ARRESTER



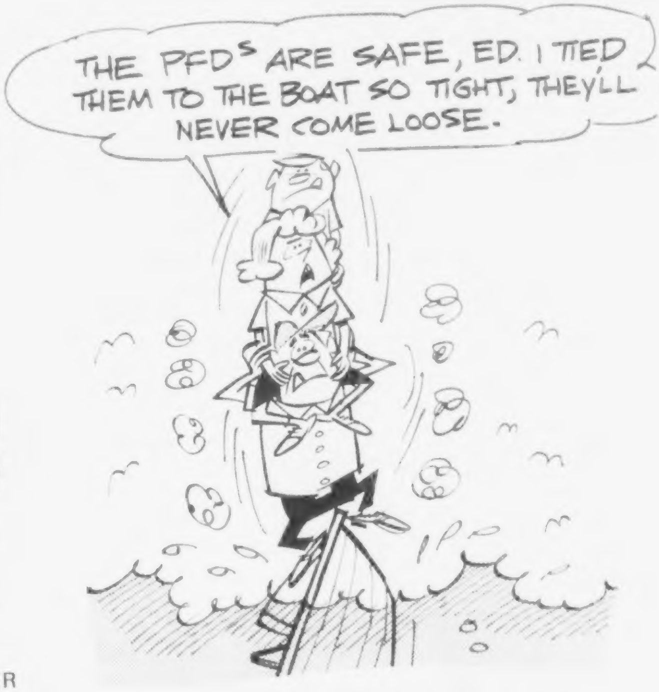
BACK FIRE FLAME ARRESTER

Personal Flotation Devices (PFDs)

It is important that you understand the definition of a Personal Flotation Device. There are many things which may be used as general life-saving devices in emergencies. Perhaps a good example of one would be the beverage cooler which some skippers carry in their boats. The important difference between these and PFDs is that a Personal Flotation Device is designed to keep an *individual* afloat in the event of an emergency.

Personal Flotation Devices must be Coast Guard approved and are classified by "Type" according to performance and design.

ALL PERSONAL FLOTATION DEVICES (PFDs) THAT ARE PRESENTLY ACCEPTABLE ON RECREATIONAL BOATS FALL INTO ONE OF THESE DESIGNATIONS. ALL U.S. COAST GUARD APPROVED PFDs MUST BE IN GOOD AND SERVICEABLE CONDITION. TYPE I, II, III & V PFDs MUST BE AN APPROPRIATE SIZE FOR THE PERSONS WHO INTEND TO WEAR THEM, AND BE READILY ACCESSIBLE. TYPE IVs MUST BE IMMEDIATELY AVAILABLE.



THE PFD'S ARE SAFE, ED. I TIED THEM TO THE BOAT SO TIGHT, THEY'LL NEVER COME LOOSE.

Type I

A Type I PFD has the greatest degree of buoyancy and is designed to turn most UNCONSCIOUS persons in the water from a face down position to a vertical or slightly backward position. The adult size device provides a minimum buoyancy of 22 pounds and the child size provides a minimum buoyancy of 11 pounds. The Type I PFD also provides the greatest protection to its wearer. The Type I is effective on all waters, but is especially recommended for offshore and ocean cruising when there is a probability that rescue will be delayed.

Type II

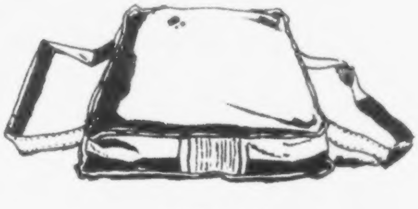
A Type II PFD is any wearable device designed to turn its wearer in a vertical or slightly backward position in the water. The turning action is not as pronounced as with a Type I and the device will not turn as many persons under the same conditions as the Type I. An adult size device provides a minimum buoyancy of 15 1/2 pounds, the medium child size provides a minimum of 11 pounds, and the infant or small child size provides a minimum buoyancy of 7 pounds.

Type III

A Type III PFD is any wearable device designed so that wearers can place themselves in a vertical or slightly backward position. The Type III has the same buoyancy as the Type II PFD, but, there is no required turning moment. It can, however, allow greater wearing comfort and is particularly useful when water skiing, sailing, hunting, or engaging in other water sports.

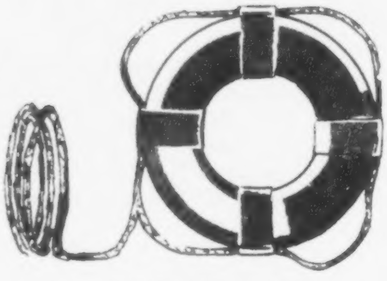
Type IV

A Type IV PFD is any device designed to be grasped and held by the user until rescued as well as thrown to a person in the water. It is not designed to be worn. The most common Type IV devices are a buoyant cushion and a ring buoy. Type IV PFDs must be immediately available.



CUSHION

Buoyant cushions do not provide good protection for children, nonswimmers, and injured persons because they must be held. When using them, grasp the straps or put your arms through the straps and hug the cushion to your chest. Never wear the cushion on your back like a pack since it will turn your face under water. Since they receive rougher treatment than other PFDs, and, as result, wear out faster, inspect them frequently for excessive stiffness, mildew odor, and broken straps.



RING LIFE BUOY

If a ring life buoy is carried, attach approximately 60 feet of line to the grab line and mount the ring buoy on brackets where it will be immediately available. When throwing it, be careful not to hit the person. Try to throw past the person if a line is attached or upstream if not.

Type V

A Type V device is any approved wearable device designed for a specific and restricted use. The specific approved use of a Type V will be described on the device. Some Type V PFD's are also approved as a Type III device, such as "exposure coveralls".

Requirements for Recreational Boats

The number and Type required on a recreational boat depends on the length of the boat:

1. All recreational boats less than 16 feet in length, and all canoes and kayaks of any length must have one Type I, II, III,IV, or V device (of a suitable size) for each person aboard.

2. All recreational boats 16 feet in length and over, except canoes and kayaks, must have one Type I, II,III, or V device of a suitable size for each person aboard, and, in addition, one throwable Type IV device.

Wearing and Readiness for Use

Give this requirement a lot of thought. Although your PFDs should be kept where they won't get kicked around or abused, they must be readily accessible when you or any guests are in the boat. The best thing to do is wear theml Of course, when the boat is not in use, PFDs should be stowed in a dry, well-ventilated place. Before getting underway, bring them out and put them on or at least put them where they can be grabbed in an instant. If you are ever boarded by a Marine Law Enforcement Officer for examination and they find that your PFDs aren't quickly accessible, you will receive a citation (ticket)!

Here's an idea that works well...Make your PFDs really personal by stenciling the names of your family members on them. For example; on yours, stencil "Captain" or "Skipper" and your name, then for your spouse stencil "1st Mate" and name, and for the kids (if any), "Crew" and their names.

Next, get all hands to put them on and adjust the straps and fasteners for each individual before you leave the launch area. Keep the fasteners unhooked to eliminate that step when time is more critical. Now your PFDs will be ready for each wearer. Finally, a lot of those people who drowned were Skippers who were apparently too proud, too foolish, or too something to put on their PFD. With the variety of designs available you should be able to find one that you can **live** with.

Who Should Wear a PFD?

Everyone should wear a PFD; children especially. Granted, the decision involves personal judgement but on small boats it is particularly important. Small children are almost always active and like to climb around exploring. All nonswimmers, both children and adults, should wear a PFD in the boat. If you have any passengers or guests who might be physically handicapped, they will have special flotation needs. They should have a PFD which they have tried in a swimming pool prior to going out. If they are unable to quickly don the device alone or in the water, see that they wear a PFD in the boat.

When to Wear a PFD

Again, this is a judgement situation. If not all the time, whenever the weather worsens from anything but clear and calm, get all hands into a PFD. In areas of heavy boating traffic or when you're taking the boat through choppy water such as the mouth of a river or a tidewater inlet, put them on. Professional mariners, Coast Guardsmen, and all Old Salts will get into a PFD at the drop of a hat. (That's how they got to be an Old Salt).

Stowage and Care of PFDs

Most PFDs will last a long time if you give them reasonable care. Don't put them away wet. Every now and then, air and dry them in the sun. Before you put them away, check for tears and broken, or torn straps. Get rid of a damaged PFD and replace it with a serviceable one. Never allow a PFD to be used as a cushion unless it was meant to be one. Nor should you permit them to be used as a bumper, fender, or as a toy. A number of people have drowned needlessly because a PFD wasn't available-or even worse-wasn't used. Don't forget-you are the Skipper and you set the proper example by wearing your PFD. Finally, hold an occasional drill with the PFDs in the boat. Get your people used to getting their PFDs out and put on quickly.

HEY, DAD, I FOUND THE PFDs

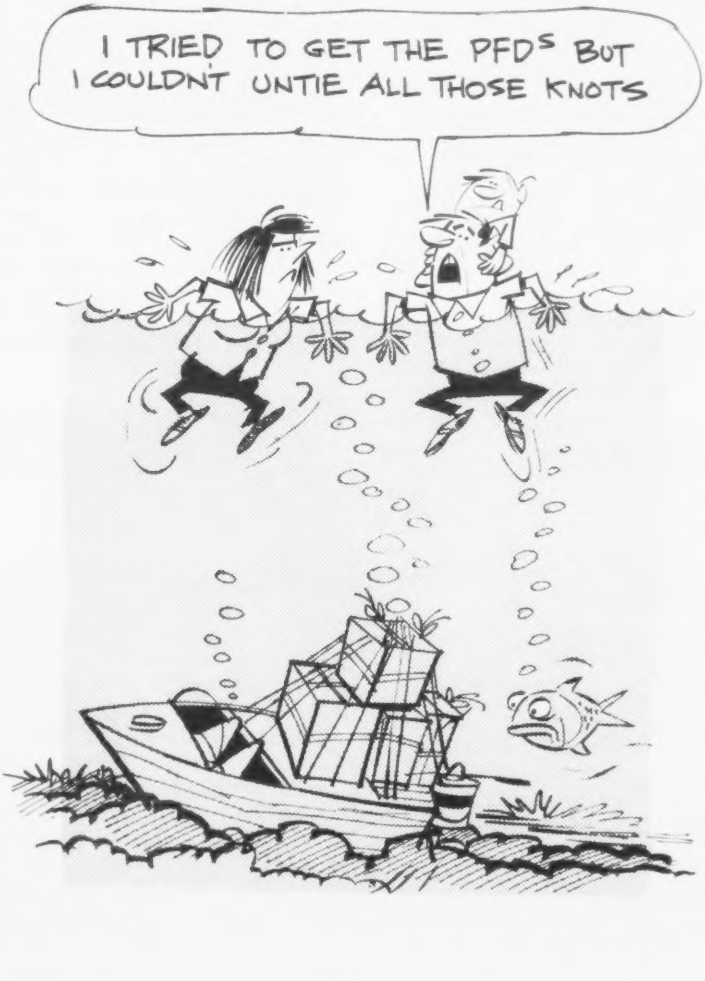
QUICK QUIZ: PFDs

1. How many PFDs are you required to have in a Class I boat? ________
2. If you're throwing a ring life buoy to a person in the water, be careful not to ______________________.
3. A buoyant cushion should never be worn on your ____________.
4. You can tell it's an approved PFD by the ______________________.
5. When out in your boat, keep your wearable PFDs readily ______________________.

Ventilation

The greatest cause of fire and explosions aboard recreational boats is gasoline fumes (vapor) collecting in the low parts of the boat (bilges). Gasoline vapor is heavier than air and sinks to the lower compartments. If a flow of clean air isn't present to blow gas vapor out of the boat then it sits there waiting for the first spark—from a cigarette ash—an electric switch—and... Think about this for a moment, one cup (8 oz.) of gasoline allowed to vaporize has the same explosive power as a STICK OF DYNAMITE. It doesn't take a lot of imagination to picture what effect that power would have exploding in the bilges of a 25-foot cabin cruiser.

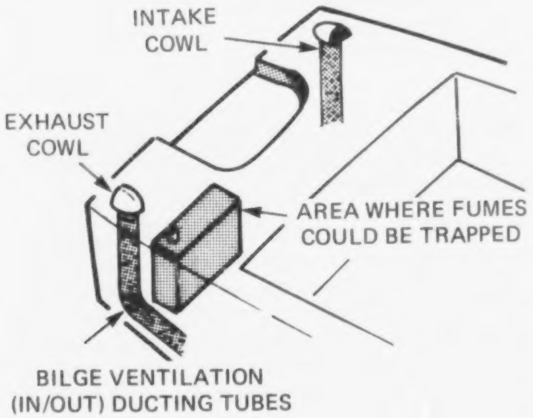
No completely foolproof ventilation system has yet been developed. However, some form of adequate ventilation is required by law.


I TRIED TO GET THE PFDS BUT I COULDN'T UNTIE ALL THOSE KNOTS

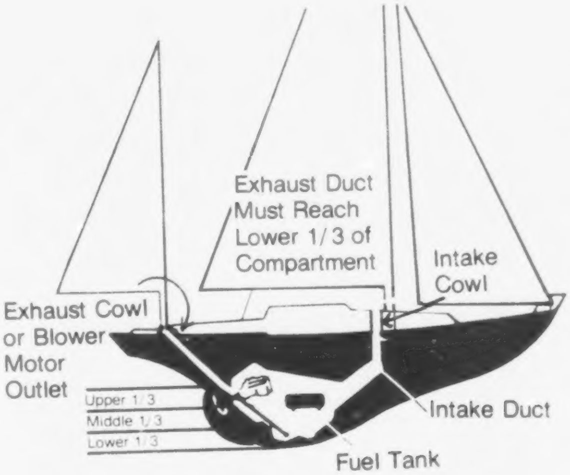
Fresh air is ducted into low spaces using wind scoops (cowls). Large flexible tubes lead into the areas to be ventilated from the wind scoops. A similar tube leads to the exhaust cowl where the collected vapor is vented safely overboard. The flexible tubes connecting the low areas with the intake and exhaust cowls should be at least 2 inches in diameter. The duct diameter depends on the compartment volume. Shown on the next page is a sketch of a typical outboard motorboat ventilation system with a fixed fuel tank.

Note that the intake cowl faces forward to scoop in the air and force it into the compartment. The exhaust cowl faces aft; the wind blowing over it creates a slight vacuum, helping to draw out any accumulated vapors. REMEMBER this system only works well when the boat is going forward or when there is a breeze blowing from ahead.

The same ventilation requirements apply to auxiliary sailboats, but, as can be seen in the drawing below, the engine location in the lower part of the deep hull can make routing the ventilation ducts very difficult. It is important that ventilation in this type of boat not be neglected. Sailboats spend a great deal of time operating with the engine shut down. This means that air circulation created by the engine breathing is non-existent. When the wind dies, the motor must be started and it is critical to have the engine compartment free of fumes. Adequate ventilation is of primary importance in sailboats.


INTAKE COWL
EXHAUST COWL
AREA WHERE FUMES COULD BE TRAPPED
BILGE VENTILATION (IN/OUT) DUCTING TUBES

Special vapor and explosion-proof electric fans are required with inboard and inboard-outboard motors. If you choose a powered blower make sure you select a marine-type, spark-proof electric switch to turn it on.


Exhaust Duct Must Reach Lower 1/3 of Compartment
Intake Cowl
Exhaust Cowl or Blower Motor Outlet
Upper 1/3
Middle 1/3
Lower 1/3
Intake Duct
Fuel Tank

Intake Duct Must Go Below Level of Carburetor

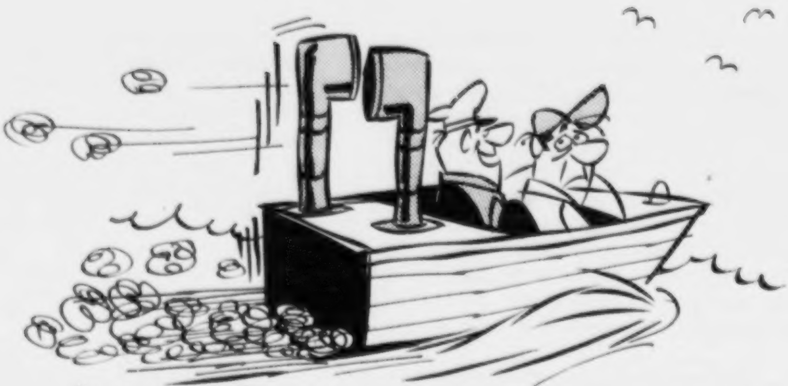
QUICK QUIZ: Ventilation

1. Gasoline is most dangerous when it turns into a ________ .

2. The best way to prevent danger from fuel vapor is to have adequate ________ .

3. A well-ducted ventilation system will have at least one
________ duct and one
________ duct.

4. Gasoline in boats is always a safety hazard because the vapor is ________ than air.



"YOU CAN'T GET TOO MUCH VENTILATION, I ALWAYS SAY!"

Signaling Devices (Sound)

There will be times when you will need to make loud sound signals as a means of warning. For example, in periods of low visibility like fog, mist, heavy rain, etc., you are required to make proper signals with a horn, whistle or bell depending on the size of your boat.

Boats less than 12 meters (40 feet) must have some means of making an efficient sound signal. A police whistle will do; no bell is required.

Boats 12 meters to less than 20 meters (66 feet) must have a whistle or horn which is audible for 1/2 mile. A bell is also required. Horns can be of the freon or electric powered variety.

NOTE: Boats less than 16 feet will not be issued a notice of violation by the Coast Guard for no sound producing device until December 24, 1990.

In general, sound producing devices are not Coast Guard approved and don't have a Coast Guard approval number. The only requirement is that boats have a device aboard which meets the requirements for their size classification.

Other Requirements and Recommended Equipment

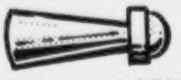
As an owner of a recreational boat, you also may have to comply with certain regulations specific to the state where your boat is registered or used. These regulations vary from state to state, depending on existing local conditions. If a boat complies with the laws of the state where it is registered, there is no extra requirement that it comply with the boating laws of another state where it is being operated temporarily. To ensure compliance with these various state laws, and to save yourself trouble later, it is suggested you contact your respective state water safety office or local Coast Guard Auxiliary unit.

Besides meeting the minimum legal requirements, prudent boaters should carry some additional safety equipment, such as:

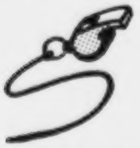
1) Portable Fuel Tanks. They should be constructed of durable material in sound condition. Any vents must be capable of being closed, and the tank must have a vapor-tight leak proof cap. Make sure the tanks are properly secured in the boat to prevent excessive movement. All portable tanks should be filled on the dock. Close all hatches and other openings on the boat before fueling.

2) Anchor and Anchor Line. All boats should be equipped with an adequate anchor and a line of suitable size and length for the boat and depth of water.

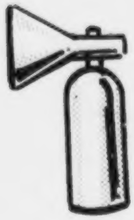
3) Manual Propulsion. You will need an auxiliary means of moving your boat if the motor isn't working. All boats less than 16 feet in length should carry an alternate means of propulsion such as oars or a paddle. If secondary mechanical propulsion is used (another outboard or trolling motor) it should use a separate fuel and starting source from the main propulsion system.



ELECTRIC HORN



POLICE WHISTLE



FREON HORN

4) Dewatering Devices. All boats should carry at least one effective manual dewatering device (bucket, can, scoop). This is in addition to any installed electrical bilge pump.

Fire Extinguishers

I know that I need fire extinguishers, but what type and how many? The answer to this question is again based on Federal requirements. The number of approved fire extinguishers a motorboat is required to carry depends upon the class and type of construction of the motorboat. Fire extinguishers are required on all motorboats where explosive or flammable gases or vapors can be trapped. All motorboats must carry the MINIMUM number required.

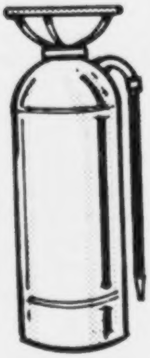
Extinguishers approved for motorboats are hand-portable, of either the Coast Guard B-I or B-II classification.

Each approved fire extinguisher is classified by a letter and a number. The letter indicates the TYPE OF FIRE:

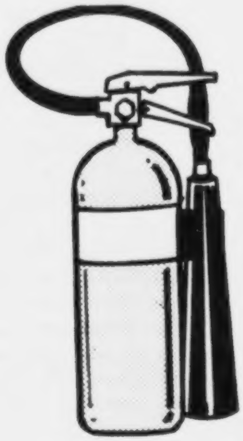
A — Fires of ordinary combustible materials.
B — Gasoline, oil and grease fires.
C — Electrical fires.

The number represents the amount of extinguishing agent it contains.

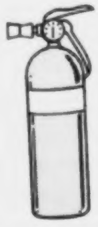
Now, how can you be sure that the extinguisher you have purchased or are about to purchase meets Coast Guard approval? It's easy enough, just look at the label. Coast Guard Approved extinguishers are identified by the following marking: "Marine Type USCG Approved, Size . . ., Type . . ., 162.208/", etc.



DRY CHEMICAL
TYPE
EXTINGUISHER



CARBON DIOXIDE
AND
FREON TYPE
EXTINGUISHERS



FOAM TYPE
EXTINGUISHER

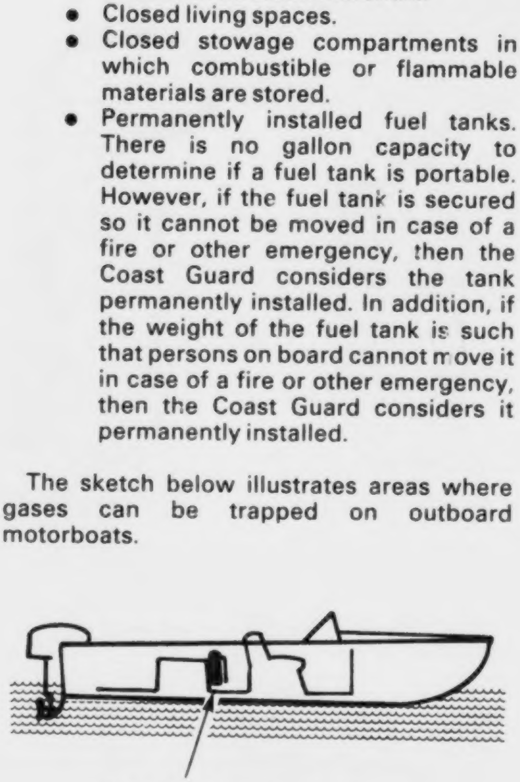
Coast Guard Classes	UL Listing	FOAM (Gals.)	CARBON DIOXIDE (LBS.)	DRY CHEM (LBS.)	HALON (LBS.)
B-I	5B	1.25	4	2	2.5
B-II	(6B)*	2.5	15	10	10
—	10B	—	10	2.5	5
—	20B	2.5	50	4.5–6	13

*UL rating 6B is no longer issued.

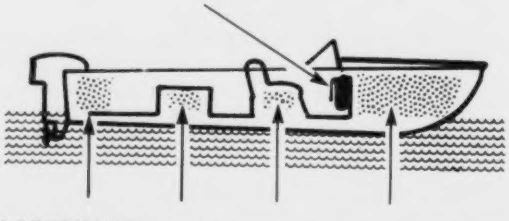
Fire extinguishers must be carried on ALL motorboats that meet one or more of the following conditions:

- Inboard engines
- Closed compartments under thwarts and seats where portable fuel tanks may be stored.
- Double bottoms not sealed to the hull or which are not completely filled with flotation materials.
- Closed living spaces.
- Closed stowage compartments in which combustible or flammable materials are stored.
- Permanently installed fuel tanks. There is no gallon capacity to determine if a fuel tank is portable. However, if the fuel tank is secured so it cannot be moved in case of a fire or other emergency, then the Coast Guard considers the tank permanently installed. In addition, if the weight of the fuel tank is such that persons on board cannot move it in case of a fire or other emergency, then the Coast Guard considers it permanently installed.

The sketch below illustrates areas where gases can be trapped on outboard motorboats.



PLACES FOR EXTINGUISHER



PLACES WHERE GAS FUMES COULD BE TRAPPED
(Ventilation required also)

Check extinguishers regularly to be sure that they are fully charged, gauges are free, and nozzles are clear.

EENIE, MEENIE, MINEE, MOE ...
FIRE
FIRE
FIRE

MINIMUM REQUIREMENTS

Class A and Class 1 Boats with NO fixed fire extinguishing system installed in machinery spaces, must have at least one Type B-I approved hand-portable fire extinguisher. When an approved fixed fire extinguishing system is installed in machinery spaces, no Type B-I extinguisher is required. If the construction of the boat does not permit the entrapment of explosive or flammable gases or vapors, no fire extinguisher is required.

Class 2 Boats must have at least two Type B-I or at least one Type B-II approved hand-portable fire extinguisher. When an approved fixed fire extinguishing system is installed, one less Type B-I extinguisher is required.

Class 3 Boats must have at least three Type B-I or at least one Type B-I PLUS one Type B-II approved portable fire extinguisher. When an approved fixed fire extinguishing system is installed, one less Type B-I extinguisher is required.

To sum up the requirements, study the following table for a moment.

Class of Boat	When no fixed fire extinguishing system in engine space	When a fixed fire extinguishing system is installed in engine space
A	One B-I	None
1	One B-I	None
2	Two B-I or one B-II	One B-I
3	Three B-I or one B-I and one B-II	Two B-I or one B-II

You now know what type and how many fire extinguishers are required, so what else is there? Several things, such as where they should be located, how they should be cared for, and how they are used.

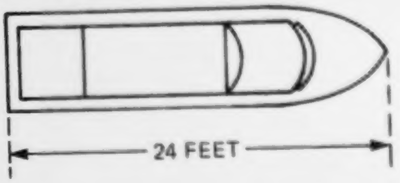
Suppose you store your fire extinguisher in the bow storage compartment. In this location a very agile person could probably retrieve it in 2 or 3 minutes. In that time your boat and your life could be lost. Check your extinguishers, are they located where they are easy to grab? Make sure you place them where you won't have to reach through any flames to get them!

Make frequent checks to be sure your extinguishers are in their proper stowage brackets and undamaged. A cracked or broken hose should be replaced, and nozzles should be kept free of obstructions. Extinguishers having pressure gauges should show pressure within the designated limits. Locking pins and sealing wires should be checked to make sure that the extinguisher has not been used since last recharged. Extinguishers should never be tried just to see if they are in proper operating condition. The valve might not reseat and result in a slow leak. A discharged extinguisher should be recharged right away!

"MARK YOUR CONTAINERS SO THERE WILL BE NO MISTAKES."

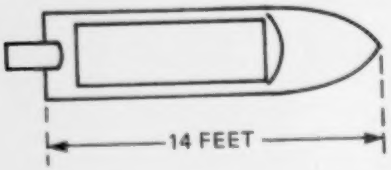
QUICK QUIZ: Fire Extinguishers

1. This is a sketch of a 24-foot, open-day cruiser with an inboard gasoline engine and permanent fuel tanks installed. It does *not* have a fixed fire extinguishing system installed.



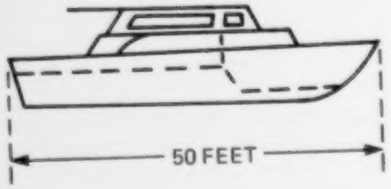
What type and how many fire extinguishers does this boat require?

2. Shown below is an open outboard runabout 14-feet in length with a closed fuel compartment.



What type and how many fire extinguishers does this boat require?

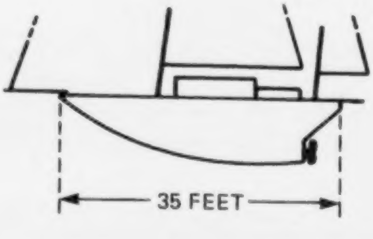
3. Shown below is a sketch of a 50-foot cabin cruiser with a fixed fire extinguishing system installed in the machinery spaces.



What type and how many hand-portable fire extinguishers does this boat require?

" I FIGURED WITH ALL THIS WATER, WHO NEEDS A FIRE EXTINGUISHER."

4. Shown below is a sketch of a 35-foot auxiliary sailboat. It is powered by sails and a small inboard engine without a fixed fire-extinguishing system in the engine space.



What type and how many portable fire extinguishers does this boat require?

____

Water Pollution and Littering Requirements

Laws meant to prevent water pollution have been around for quite a while. The Refuse Act of 1899 prohibits the throwing, discharging or depositing of any refuse into the waters of the U.S. to a distance of three miles from the coastline. This includes trash, garbage, oil or other liquid pollutants. In addition, the Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances in quantities which may be harmful into U.S. navigable waters, the contiguous zone (to 12 miles), or waters to within 200 miles in some cases.

You must immediately notify the U.S. Coast Guard if your boat discharges oil or hazardous substances into the water. You should also help to ensure that others obey the law by reporting polluting discharges which you observe. If possible, give the substance, location, time observed, source, size and color. (Call toll free 800-424-8802). Don't attempt to take a sample yourself. If uncertain as to the identity of the substance, it's best to stay clear.

Federal regulations issued under the Federal Water Pollution Control Act also require boats 26 feet in length and over to have posted a placard, at least 5 by 8 inches, made of durable material and fixed in a conspicuous location such as the machinery spaces or bilge, which states:

DISCHARGE OF OIL PROHIBITED

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000.

IT GETS RID OF THE FUMES AND GIVES ME LITTLE BOOST, TOO.

All recreational boats with installed toilet facilities must also have an installed and operable marine sanitation device (MSD). Boats 65 feet and under may use a Type I, II, or III MSD. All installed MSDs must be Coast Guard certified. These certified devices are labeled as such, except for some holding tanks which are already certified by definition under the regulations if they store only sewage and flushwater at normal temperature and pressure.

E. Trailerboating

More than 90% of the boats in this country are trailerable. This allows many boaters to tow their boats long distances and enjoy waters far from home. Whether the trip is short or long, trailering a boat requires knowledge of trailer safety and proper operation.

Successful Trailering requires three things: the proper trailer, the right hitch and a tow vehicle with adequate power to pull the rig.

The Anatomy of a Trailer

1. Legal Requirements

All vehicles using the roads and highways must conform to certain legal safety requirements and trailered boats are no exception. To be certain that your rig meets the legal requirements and that you have the latest information, consult the state police or motor vehicle bureau.

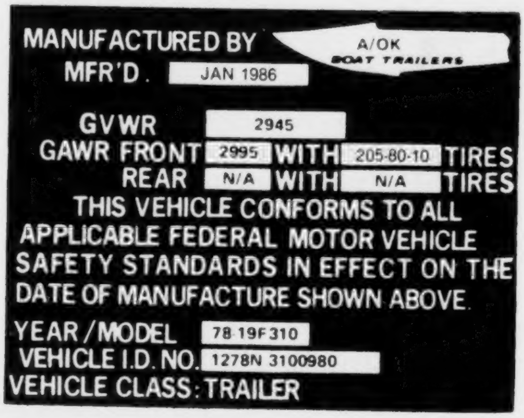
2. Trailer Classification

Trailers are divided into classes based on the total weight of the trailer and its load at a test speed of 60 miles per hour. A decrease in speed will allow a slight increase in weight. However, if the total weight approaches to within 15% of the maximum weight for the class, it is recommended that a trailer of the next higher class be selected.

CLASS 1. Gross weight of trailer including load not to exceed 2000 pounds.
CLASS 2. Gross weight of trailer including load of 2001 pounds through 3500 pounds.
CLASS 3. Gross weight of trailer including load of 3501 pounds through 5000 pounds.
CLASS 4. Gross weight of trailer including load of over 5000 pounds.

3. Capacity Information

Federal Law requires that all trailers have certain important capacity information displayed. The Gross Vehicle Weight Rating (GVWR) for the trailer must be displayed, which includes the trailer and all weight it is expected to carry. If the rating of the trailer is within 15% of the total weight of your boat, gear and trailer it is recommended that you select the next larger capacity trailer. The Gross Axle Weight Rating (GAWR). Capacity information will show the size of tires needed to carry the load for which the trailer is rated. On multi-axle trailers, the combined Gross Axle Weight Rating (GAWR) of all axles must be equal to or greater than the Gross Vehicle Weight Rating (GVWR) for the trailer.

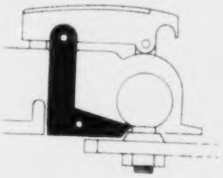


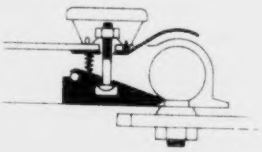
MANUFACTURED BY A/OK BOAT TRAILERS
MFR'D. JAN 1986

GVWR 2945
GAWR FRONT 2995 WITH 205-80-10 TIRES
REAR N/A WITH N/A TIRES
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
YEAR/MODEL 78 19F310
VEHICLE I.D. NO. 1278N 3100980
VEHICLE CLASS: TRAILER

4. Coupler

The coupler is the mechanism which attaches the trailer to the hitch. It is generally one of two basic types, the latch or the screw type.





The coupler *must* be of a size which matches the ball. The size of the ball is determined by the Gross Vehicle Weight Rating (GVWR). A ball which is too small for the coupler could cause the trailer to break loose from the hitch on your vehicle. Make sure the coupler is fastened down tight with lock washers. All couplers manufactured after 1973 will have the Gross Vehicle Weight Rating stamped on them.

5. Supports

While in the water the hull is supported by an even pressure over the entire bottom surface. Even the best boat trailer cannot duplicate the support found in the water. Since so much of the boat's life is spent on the trailer, it is of great importance that the trailer gives the best possible support. Improper supports have caused split bottoms and other hull damage, therefore, skimping on the trailer is false economy.

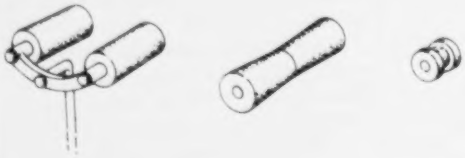
Boat trailers have one, or a combination of two types of supports.

Rollers and pads can be adjusted both up and down, forward and backward to provide the best possible support. To prevent sagging, warping or other hull damage, the trailer must be adjusted to support any portion of the boat which has heavy equipment installed. Inboard-outdrive and outboard motorboats must have good transom support. The winch column and axle(s) can also be adjusted to provide proper length and balance. When any part that has a matching component on the other side of the trailer is adjusted, it is important to ensure that both are adjusted to properly oppose each other. Even a minor fore-and-aft difference in the way the rollers, pads or axle are adjusted can create a serious problem for the whole rig.

6. Tie Downs

To prevent the boat from sliding off the trailer or becoming misaligned during travel, tie-downs are needed. Special hooks or loops should be welded to the trailer for that purpose. Bow and stern tie-downs are the most crucial, but others may be added if needed. Do not depend on the winch line to hold the bow in place, use a bow tie-down.

ROLLERS:

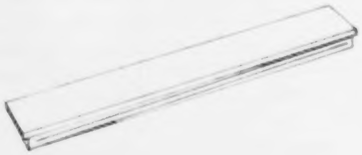


MINIMUM support
Most efficient for loading and launching because of minimum friction.

ROLLERS are preferred if—

- trailer is correct length
- trailer has enough good hard rubber rollers
- hull is correctly resting on ALL support rollers
- most launching will be done from the trailer
- boat is never overloaded when it is out of water

PADDED BOLSTERS:



MAXIMUM support
Most troublesome for loading and launching because of too much friction.

PADS are preferred if—

- boat is launched with slings or hooks
- trailer is a submersible type

It is important to remember that the trailer must support the boat properly. For most hulls the vital support points are:

- the forefront (just under the bow)
- the line of the keel and the planking on each side
- the turn of the bilge (where the bottom meets the side), especially where interior weights are concentrated
- the transom

7. Brake Lights and Turn Signals

Brake lights and turn signals are required on trailers and should be wired to function with those on the tow vehicle. The useful life of these lights is greatly increased if they are detachable and are removed before launching. Stranded wire is recommended to reduce vibration damage. A good ground is essential, and a separate ground cable between the trailer and the tow vehicle may be necessary. The addition of lights and reflectors to the rear of the boat or trailer beyond that required by law, will significantly increase safety at night.

8. Tires

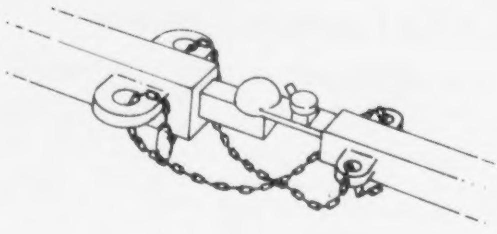
The size and weight-carrying capacity of tires vary greatly. Federal Law requires that the load capacity and other important information be legibly displayed on the sidewall of the tire. Usually, the larger the tire size, the better the towing, particularly on bumpy roads. Smaller diameter tires turn faster, putting more wear on the tread and wheel bearings. To eliminate the need for two spare tires, it may be possible to order a trailer with the same size wheels, tires, and bolt pattern as those on the towing vehicle. The load carrying ability of a tire varies with inflation pressure. It is therefore important to routinely check tire pressure.

9. Bearing Protectors

Any trailer subject to immersion should have bearing protection. Bearing protectors hold grease under spring loaded pressure, which reduces the possibility of water entering the bearing proper. They should be checked each time the trailer is used.

10. Safety Chains

Safety chains are an important safety feature, and are required in many states. They should be permanently affixed to the trailer, and crossed under the hitch in such a way that they will catch and hold the tongue should the ball fail. The chains should be attached to the towing vehicle at points separate from the ball and the bracket that holds the ball. They should be attched in an "X" criss-cross pattern. The chains should be just long enough to allow the rig to turn freely, but not so long that the chains drag. The shackles should be attached in such a way that they will not jump free.



11. Trailer Brakes

Although state laws differ in their requirements for trailer brakes, most states require brakes on trailers above a certain gross weight and some specify the types which are acceptable. To ensure that your trailer is in compliance with the law, check with your state police or motor vehicle department. The three most popular braking systems in use today are: surge brakes, electric brakes, and electrically actuated hydraulic brakes. It is recommended that you select a trailer brake which is actuated by those of the towing vehicle. An emergency breakaway system which will actuate the trailer's brakes should the trailer accidentally separate from the towing vehicle, is a recommended feature.

THIS CAR DRIVES SO WELL, IT SEEMS LIKE I'M NOT PULLING ANYTHING.

THE TOW VEHICLE

The average passenger car is designed to carry only people and will need beefing up if it is to pull anything but the lightest of trailers. Starting with the 1980 models, the pulling capacity of a passenger vehicle dropped to about 4,000 pounds, and heavier loads may require the purchase of a pick-up truck, van, or other specially equipped utility vehicle. Except for specially equipped utility vehicles, you should not tow a trailer heavier than your car. For manufacturer's recommendations, check with your dealer for the best towing package. These packages include items such as non-slip differential, heavy duty cooling system, heavy duty flasher, oversize battery and alternator, heavy duty suspension, special wiring, special rear axle ratio, and larger tires and wheels.

ESSENTIALS:

1. Adequate Power

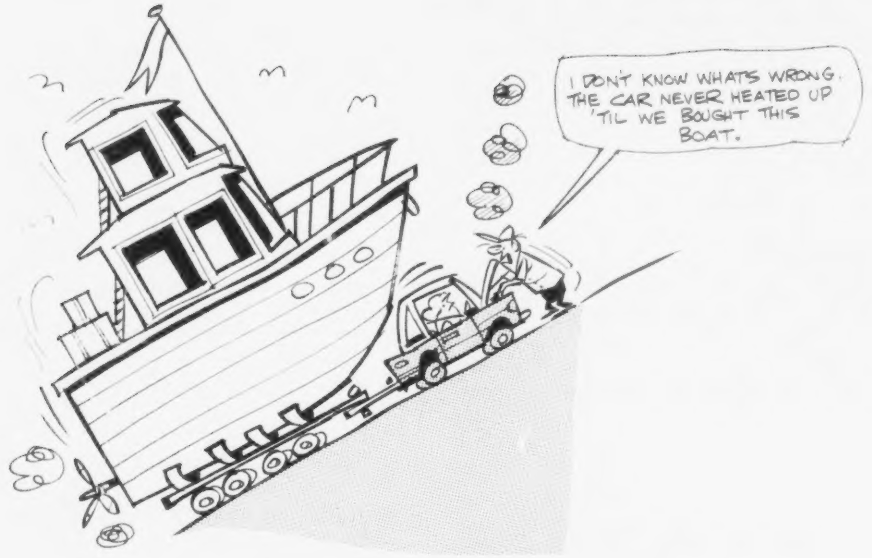
The tow vehicle must have enough power to merge safely with highway traffic when towing maximum load. It must also be able to climb commonly encountered hills without losing speed. Therefore, it is recommended that you get the largest engine available.

2. Cooling

For cooling, the engine may need a heavy duty, high capacity radiator with more core tubes to speed heat release, possibly a special fan shroud, a coolant recovery unit, and a thermostat operated spray-coolant unit to spray cool water on the radiator core tubes when the temperature on the coolant goes too high.

3. Transmission

Towing a trailer places an extra load on the transmission. This may generate enough heat to thin out the transmission fluid and damage the tramsmission. To prevent this, it may be necessary to install a small radiator to cool the transmission fluid. The driver of a towing vehicle must always be on the alert for transmission leaks, slippage or rough shifting, all of which are indicative of transmission problems.


I DON'T KNOW WHATS WRONG.
THE CAR NEVER HEATED UP 'TIL WE BOUGHT THIS BOAT.

4. Brakes

Cars ordered with a towing option have oversized and/or special heavy-duty drums and linings or discs and pads. Standard auto brakes are too weak for towing all but very light trailers. Brakes should have premium linings especially on the rear, as the tongue weight keeps wheels in tighter contact with the pavement.

5. Suspension System

100 pounds of tongue weight 4 feet behind the rear axle has the same effect as 400 pounds added to the trunk of the car. To avoid excessive sagging and "bottoming out," the suspension should be beefed up with heavy duty springs, air shocks, or air bags. Heavy duty shock absorbers are necessary to control the added weight. This will allow the vehicle to ride in a near normal attitude and improve visibility and handling.

THE HITCH

Choosing the proper class of hitch for the weight of the trailer being towed is very important. There are two basic types of hitches, the wieght carrying hitch and the weight distribution (or load equalizer) hitch.

1. Hitch Classes

The class of hitch required will depend on the gross trailer weight and its tongue weight. The dealer that supplied the towing vehicle can normally provide guidance in purchasing a suitable hitch.

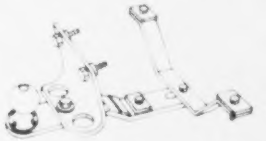
2. Weight Carrying Hitches

The simplest and most inexpensive weight hitch is the so called "bumper hitch" and is mounted on the rear bumper of the car. While it may be adequate for very light trailers, it is not recommended and is banned in several states. The hitch mounted on the step-bumper of many light trucks are not considered bumper hitches.

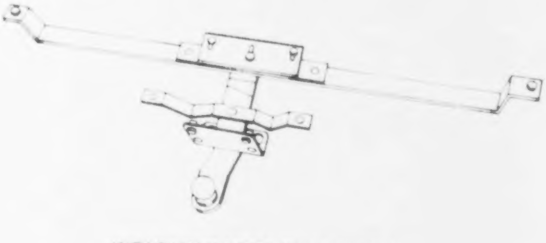
Weight carrying hitches come in various sizes and configurations depending upon the gross trailer weight, the tongue weight and the tow vehicle characteristics. As the name implies, the weight carrying hitch holds the entire tongue weight of the trailer.

3. Weight Distribution Hitch

The rear of a tow vehicle is generally loaded with luggage, gear, and often a back seat full of kids. When the tongue weight of a loaded trailer is added, a heavy strain is placed on the rear tires, shocks and springs of the tow vehicle. It may also place so much weight on the rear of the car that some of the weight on the front wheels is removed, making control difficult and operation dangerous. A weight distribution hitch redistributes much of this weight to all four wheels of the tow vehicle as well as the wheels of the trailer, resulting in a better handling, safer operation and less wear and tear on the tow vehicle.

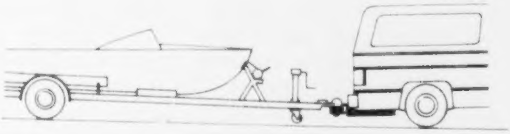


WEIGHT CARRYING HITCH

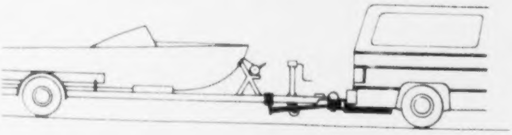


WEIGHT CARRYING HITCH

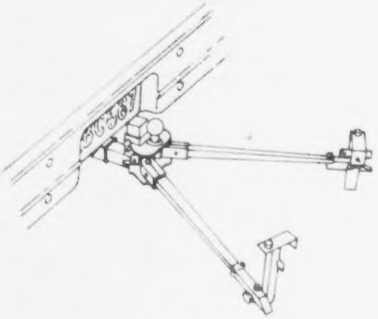
Some weight distribution hitches are equipped with antisway bars which helps control trailer sway and improves control.



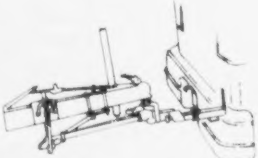
WEIGHT CARRYING HITCH



WEIGHT DISTRIBUTION HITCH



WEIGHT DISTRIBUTION
(LOAD EQUALIZING) HITCH



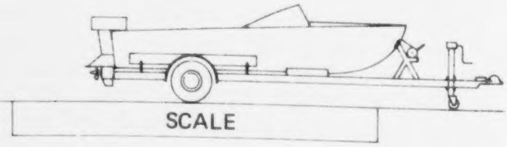
WEIGHT DISTRIBUTION
(LOAD EQUALIZING) HITCH

WEIGHT

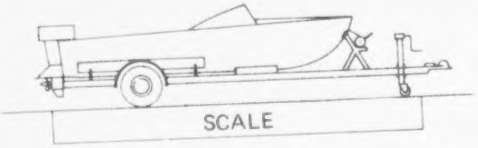
Safe trailering requires that the trailer is properly balanced and loaded. Overloading a trailer on the highway may be as dangerous as overloading a boat on the water. The trailer-boater needs to know two important weights: gross vehicle weight and tongue weight.

Gross Vehicle Weight

To determine the gross vehicle (trailer) weight, load the trailer with everything that normally would be on it during transportation and take the rig to the nearest scales with a platform (highway weighing station, building supply company, trucking company, junk yard, etc.) and weigh the trailer by itself, unhitched and supported on the jack. This will give the gross trailer weight. It is



important that the gross trailer weight (Gross Vehicle Weight) does not exceed the Gross Vehicle Weight Rating as shown on the capacity label. Keep the trailer in a level attitude by adjusting the jack-caster assembly. To determine the tongue weight, move the tongue with the jack off the scale and obtain the weight on the trailer axle alone (Gross Axle Weight). The tongue jack must be adjusted to maintain a level attitude.



Gross Axle Weight

The difference between the Gross Trailer Weight and the Gross Axle Weight is the tongue weight.

The tongue weight can also be determined by placing the tongue on a bathroom scale, if the tongue weight does not exceed 250 pounds.

In loading the trailer it is important that the weight distribution on the trailer is such that the recommended tongue weight is maintained. If the tongue weight exceeds that which is recommended, the extra weight on the rear of the car may make it hard to handle. If the tongue weight is less—too much weight on the rear of the trailer—it may cause the trailer to fishtail. The gross weight of the trailer may be reduced by carrying only light items such as sleeping bags in the boat, while heavy items, such as canned goods may be carried in the tow vehicle. The amount of fuel and any water in the boat (from rain) may add substantially to the trailer's gross weight and play havoc with the load distribution.

TRAILER CLASS	HITCH CLASS	GROSS TRAILER WEIGHT (MAXIMUM) (GTW)	STATIC TONGUE LOAD	RECOMMENDED HITCH TYPE
1	I	2,000 pounds or less	10-15% of Max GTW	Weight Carrying or Weight Distribution
2	II	2,001 thru 3,500 pounds	10-15% of Max GTW	Weight Carrying for lighter tongue loads; Weight Distribution for tongue loads greater than 300 lbs.
3	III	3,501 thru 5,000 pounds	15% of Max GTW	Weight Distribution
4	IV	Over 5,000 pounds	15% of Max GTW	Weight Distribution plus anti-sway device

LAUNCHING

Launching will be the critical part of your trailerboating expedition. It's embarrassing, as well as expensive, to safely travel many highway miles just to do something dumb at the moment of truth. Before going to the ramp, check with the marina operator or others to determine if there are any unusual hazards, such as a drop-off at the end of the ramp. You should prepare your boat for launching away from the ramp so that you don't hold up other boaters. This is known as "Ramp Courtesy." Preparations for launching should include: raising the lower unit to avoid scraping, installing the drain plug, releasing the tie downs, and disconnecting or removing the trailer's stop and directional lights.

Make one last check for any loose gear that might slide around during launching. Check the winch, making sure it's still in a locked position. Tilt the engine or outdrive unit to the up position so that it won't strike the ramp. Finally, just to make sure, if you have a tilt type trailer check the tilt lock and safety chain to make sure the tilt is still locked.

When launching or recovering, never turn the car's engine off, and keep the parking brake set while you work the boat off the trailer. Only the driver should be in the towing vehicle during launching and recovery. One or two observers can help the driver watch the trailer and traffic. Keep everyone else away from the launching ramp.

Back down slowly until the stern of the boat is in deep enough water to float free when it is pushed off the trailer. Stop the car and set the emergency brake.

It is also prudent to use a tire stop to avoid an unexpected dunking of trailer and car.

Many trailerboat owner's worst moments have occurred at busy launching ramps because they have not practiced backing their rig. Before you attempt a launching, you should put in a couple of hours in a deserted parking lot learning how to back your rig through a maze of cardboard boxes.

A helpful hint when backing is to place your hand on the bottom of the steering wheel and move the wheel in the direction you want the trailer to go. DO NOT OVERSTEER.

If you have an unwieldy trailer, you may want to get an auxiliary front bumper hitch which will make close-quarters maneuvering much simpler as well as keeping the drive wheels of the towing vehicle on higher, drier ground.

Make sure you NEVER, NEVER CAST off all the lines from the boat before launching. Someone on shore must have a line that is made fast to the bow of boat. The line makes it easy to shove the boat off the trailer and then pull the boat to a dock or boarding platform or back to the trailer at a wide, busy launching ramp. Unlock the tilt latch and its safety chain (if you have one). Unlock the winch and cast off the winch line hook. Push the boat off the trailer into the water. If you've kept the rollers properly lubricated, the boat will move off the ramp easily. Above all, take the time necessary to launch safely, but as soon as the boat is afloat, move the vehicle and the trailer to the parking lot and the boat to the dock for loading. Don't loiter. Make one last check to see that the boat holddown straps or clamps and winch crane handle are in the car.

Always try to avoid getting the trailer hubs in the water. If you cannot avoid dunking them, at least let them cool first. If you don't, the sudden cooling may crack or chip the bearings, or suck them full of water.

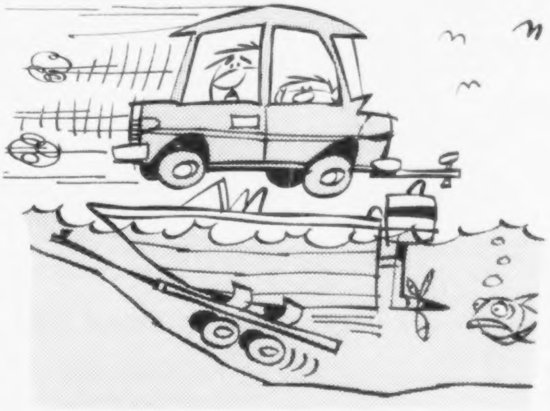
If there's a pier or float close to the launch ramp it is generally best to tie up and prepare the boat there. If not, board the boat from the ramp over the bow. The person holding the bow line should stay ashore and hold the boat until you're fully ready to start the engine.

Powerlines at launch ramps or over waterways are also potential hazards to boats. To speed launching, many boaters step the mast of their sailboats while the boat is still on the trailer. Before doing this, it is important to check for any overhead wires.

If the tip of a mast comes close to a high tension transmission line, the current may be powerful enough to actually bridge the gap and pass through the boat. It's a good idea never to get the highest point of your boat closer to any powerline than the length of the insulator which holds the powerline.

RETRIEVAL

Retrieving your boat is similar to launching and should be done with the same courtesy by reversing the procedures for launching. Unload your boat at the dock and keep it there until the trailer is ready to move down the ramp. Move the boat to the trailer and RAISE the lower unit. Winch the boat on to the trailer and secure it. Finally, move the towing vehicle and trailer with boat to the parking area for loading, housekeeping, and other maintenance chores.



"WHERE DID IT GO?"

QUICK QUIZ: Launching

Fill in the blanks;

1. Park the car and trailer clear of the ________ area.
2. Release and stow the ________ .
3. Keep ___ person(s) in the car and ___ in the boat.
4. While backing down the ramp have ___ person(s) direct you.
5. Before you get out of the car set the ________________ .

F. Review, Part I, Prelude to Boating

In this first part of the "Skippers Course" you learned the *classes* of recreational boats. You'll recall that the only factor in determining the class of a boat is its overall length. We have asked you to identify the class of a boat, given its length.

The next topic was numbering and how to properly put them on your boat.

Don't forget to carry your certificate of number with you whenever you're in the boat.

The subject of required safety equipment was next. Again we wish to emphasize this is the *legal minimum* that is required.

Boats with *inboard gasoline* engines must have an acceptable means of backfire flame control.

Personal Flotation Devices was the next and may be regarded as one of the most important topics to learn. This was followed by the ventilation requirements and the required fire extinguishers. The required sound producing devices (bells, horns, and whistles) were discussed, ending with the topic of safe boat trailering. There are several boating books and pamphlets available which you can send for that cover these subjects in more detail. For information check with your State Boating Law Administrator (App. 5).

PART II, SAFETY AFLOAT

A. Presailing Procedures

1. What About the Weather?

As the Skipper, weather is going to be a primary concern of yours. You will be interested in things like—what is the weather where I want to take the boat? Not only *now* but what is it expected to be in 6 to 8 hours?

Since the very first step in planning a boating trip is to check the weather and weather forecasts, you must know some of the weather data sources.

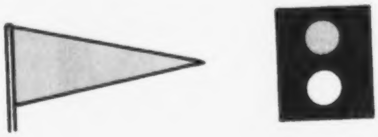
a. *Local Newspaper*. Read the whole report, not just the summary. A good idea is to tear the report out of the paper and take it with you. Make sure it applies to the waters you're going to boat in.

b. *The Telephone*. The National Weather Service publishes Coastal Warning Facilities Charts for all coastal areas plus the Great Lakes. The location and phone numbers of all National Weather Service offices plus the location and times of AM and FM radio and television marine weather broadcasts are also listed on the charts.

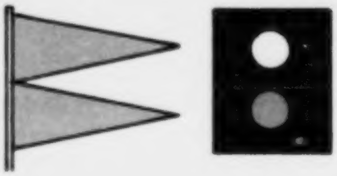
c. *Special Radio Sources*. The NOAA Weather Radio (NWR) network broadcasts continuous marine weather information on VHF-FM channels WX-1, WX-2, or WX-3 (162.55 MHz, 162.4 MHz, 162.475 MHz, respectively). Channel selection is dependent on your area of operation and specific details can be found in NWR publication NOAA/PA 76015. It is available at no cost. Write: NOAA, National Weather Service, 8060 13th St., Silver Spring, MD 20910. Attn: W112. The Coast Guard also broadcasts weather in some areas to supplement NWR coverage. Depending on the area, scheduled broadcasts are made on 2670 kHz (upper sideband) or CH22 VHF-FM, or both. Preliminary announcements are made on 2182 kHz (upper sideband) and CH16. Urgent broadcasts of developing weather systems or hazardous conditions may be made at any time.

"GOOD THING I LEARNED HOW TO SURF"

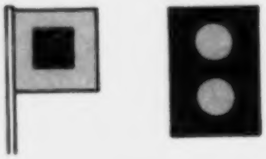
d. *Special Warnings and Storm Signals*. At many marinas, launching ramps, yacht clubs, and Coast Guard stations, storm warnings are displayed by flag hoists or lights. As the Skipper, you must know the meaning of each of these hoists and lights.



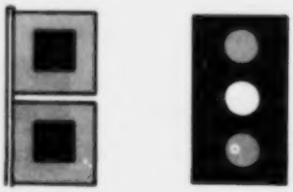
When you see this bright red pennant (daytime) flying from a storm signal flagpole it means that winds of up to 38 miles per hour are expected over the local water area. With these winds there can be waves, rough water, and whitecaps. It is called a "SMALL CRAFT WARNING' and the meaning to you is—STAY ASHORE! If your boat is tied up or moored, check all mooring lines and double them if necessary. Close all ports, hatches, and doors. Make sure your mooring cover (if used) is tightly fastened. At night the small craft warning is one red light over a white light and means the same thing–winds up to 38 miles per hour.



This signal displayed on a mast means GALE winds up to 54 miles per hour. At night this warning is displayed by a white light at the top with a red light below. The meaning of this signal is, if *possible,* get your boat out of the water. If not possible, tie it up with extra lines.

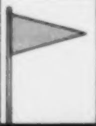
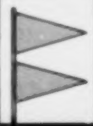
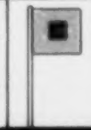
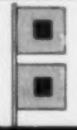
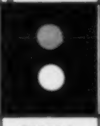
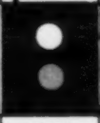
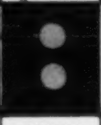
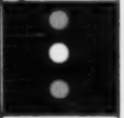


When you see this signal it means STORM with winds up to 72 miles per hour. Your boat should be out of the water and under shelter. You should be home checking flashlights, candles, and storm drains. At night two red lights, one over the other, are displayed and have the same meaning.

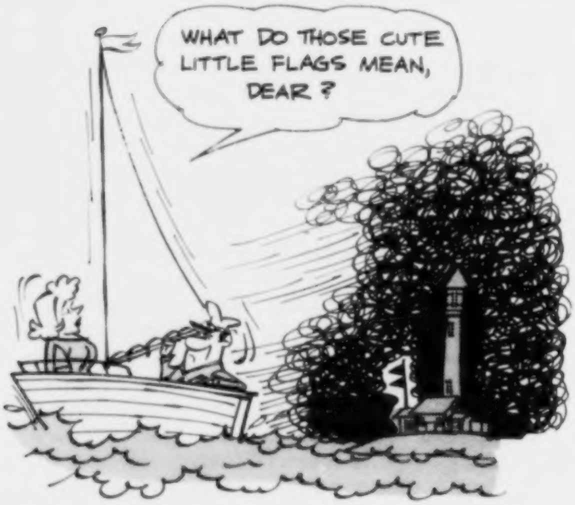


Finally, when you see this signal (and we hope you never will) it means HURRICANE with winds 72 miles per hour and up. Do the same things as with the signal for STORM only with more vigor. At night (if the pole is still standing) the signal is *three* lights. Red at the top, white in the middle, and red at the bottom.

The table below summarizes the storm signal system.

Daytime Signals				
Night Signals				
Meaning	SMALL CRAFT Winds up to 38 mph	GALE Winds up to 54 mph	STORM Winds up to 72 mph	HURRICANE Winds 72 mph and up

Don't ignore a small craft warning. A fool and his boat are soon parted. Remember too, you can get into very bad weather conditions even with a fair forecast. Line squalls, thunderstorms and the like are very unpredictable and therefore very dangerous to small craft. As the Skipper, you alone have the responsibility for the safety of your boat and its passengers. Keep an eye on the weather, make the right decisions about going in to shelter and stick to them.


WHAT DO THOSE CUTE LITTLE FLAGS MEAN, DEAR ?

Lightning

"Common" thunderstorms can also be dangerous too, because they produce lightning in addition to strong winds and rough seas. Lightning is a huge spark of static electricity which is generated from electric charges built up within cumulonimbus clouds (thunderheads). Lightning can occur within clouds, between clouds, or between clouds and the ground.

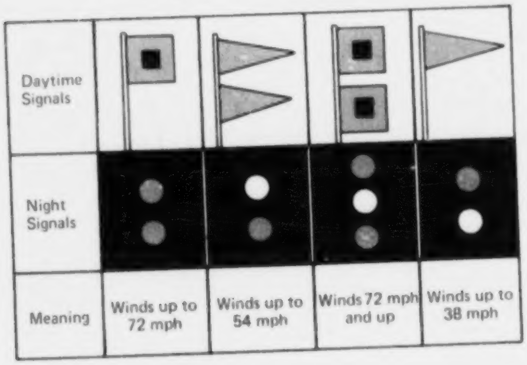
You can minimize the danger of having your boat struck by getting off the water during a thunderstorm, or by installing a grounding system on your boat. This device is similar to those found on land structures and follows the same principle. Basically, this system requires a high capacity electrical conductor to be run from the highest point on the boat to a submerged ground plate, or to an exposed metal keel.

QUICK QUIZ: Weather

1. List at least three pre-sailing sources of weather information.

2. List at least two radio weather information sources underway.

3. List the meaning of the flag and light displays shown below.



Daytime Signals				
Night Signals				
Meaning	Winds up to 72 mph	Winds up to 54 mph	Winds 72 mph and up	Winds up to 38 mph

B. Fueling

You are about to toss three to five cases of dynamite, with fuses attached into your boat. You don't think so? Well then consider this:

> You'll remember one cupful of gasoline (vaporized) has the same EXPLOSIVE power as a stick of dynamite!

This means that fueling the boat should be done very carefully. A number of serious accidents occur yearly from gasoline explosions and fires. Nearly all were due to the Skipper's failure to observe simple precautions. There are five common sense rules to apply when fueling. You must *learn* and follow them.

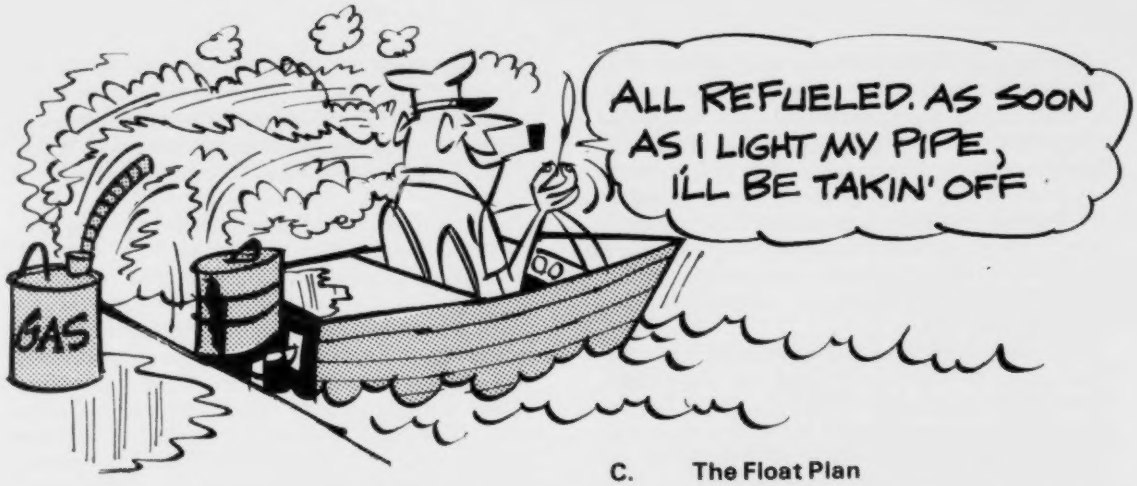
1. Always fuel the boat in good light. Fill all portable tanks on the dock, not while in the boat.

2. When the boat is tied up at a fueling dock:
   a. Don't smoke, light matches or lighters, or operate electric switches.
   b. Stop engines, motors, fans—anything that might cause a spark.
   c. Secure all fires. Don't forget the pilot light on gas stoves and refrigerator.

3. Before you start to fuel:
   a. Check the mooring of your boat and get everybody out of the boat.
   b. Close ports, windows, doors and hatches—(Keep the fumes and vapor out of the boat).
   c. Check your tanks, filler pipes, tank vents, and flame screens.
   d. Check to see how much fuel the tank will take.

4. During Fueling:
   a. Keep the nozzle of the hose in contact with the can opening to prevent static sparks.
   b. Guard against spillage—if fuel spills, wipe it up immediately. Don't let any vapor get below.

5. After fueling:
   a. Replace caps (covers) of fill openings.
   b. Open up the boat *completely* and ventilate.
   c. Air out the boat for *five* minutes.


ALL REFUELED. AS SOON AS I LIGHT MY PIPE, I'LL BE TAKIN' OFF
GAS

d. Give all low spots (engine bilges, tank spaces) the sniff test. If you smell gasoline vapor, continue to air out the boat—look for spillage and leaks.
e. Wipe up all spills.

Fueling is an important operation—and you as Skipper should do it yourself. After all, no one can do it better than you—right?

QUICK QUIZ: Fueling

1. Fueling a boat requires:
☐a. A high degree of skill.
☐b. That the boat be wide open.
☐c. A vapor detector.
☐d. Good light.

2. Gasoline is most dangerous when:
☐a. It is in a liquid state.
☐b. It evaporates and forms vapor.
☐c. In a flexible hose line.
☐d. In portable tanks.

3. Gasoline hose nozzles must be kept in contact with filler openings to prevent:

☐a. Spillage
☐b. Static electric sparks
☐c. Vapor from forming
☐d. Gas from reaching the engine bilges.

There once was a boatman named Dooling,
Who skylarked while completing his fueling.
The blast from that day blew Dooling away;
Dooling shouldn't've been fooling while fueling.

C. The Float Plan

There are two things you must do before you leave home to go out in your boat. We've already discussed the first one—check the weather. If you're a new skipper the second might be news to you. That is, file a "Float Plan." It's the same idea as that used by airplane pilots who file a flight plan. Here's what you do. As soon as you have planned a boating trip and have checked the weather, tell a *reliable* relative, friend, or neighbor, WHERE you're going, WHEN you're going, WHO you will have with you and WHEN you're coming back. Please don't ask to file your float plan with the Coast Guard, we just don't have the required facilities. Stick to your float plan once you're out on the water—if you should go to another area–then your float plan is no good. When you return from your boating trip be sure to *cancel* the float plan—that is, tell those concerned that you're back. As you might have already concluded, the reason for the float plan is simply this: If you were out in your boat without filing a float plan and if anything should happen (run out of gas—run aground, or worse) no one would know where or when to come looking for you!

A sample float plan form is shown in Appendix 3. Use it as a guide when you file yours.

It is very important that you understand why the Coast Guard emphasizes the importance of the Float Plan. Filing a Float Plan with a friend or neighbor, sticking to the plan, and cancelling it when you reach your destination, all are equally important but for different reasons. When you file a Float Plan and become overdue, someone knows that it is time to go look for you. But if you don't stick to your plan or fail to cancel it on return the Coast Guard might have a false alarm on its hands.

This is what happens when a small craft is reported overdue to the Coast Guard Rescue Coordination Center. The Coast Guard uses its resources to try to confirm that a boat *is* overdue and may be in trouble. In the next stage "Alert", Coast Guard boats and aircraft on patrol are alerted to look for the missing boat. In the last stage "Distress", extra search and rescue boats, aircraft, and even the big Coast Guard cutters could be dispatched to carry out a planned search pattern. The Coast Guard Auxiliary may also be called upon to assist. So you see, the fuel alone used in such an operation would run your boat for years. If lives are at risk, the Coast Guard *will* go out. But it takes time, money, and effort that should not be wasted on a false alarm.

SURE I FILLED OUT A FLOAT PLAN. HERE IT IS
FLOAT PLAN

QUICK QUIZ: Float plan

1. The four w's of the float plan are:
   ____ you're going.
   ____ you're going.
   ____ you're coming back.
   ____ you have with you.

'DON'T JUMP INTO YOUR BOAT!"

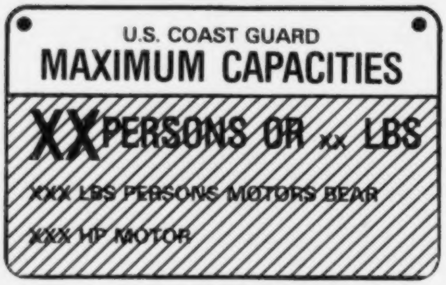
D. Making Ready to Sail

Loading the Boat

As a new Skipper this can be one of the most important subjects in this learning program. Here's the problem. In an overwhelming number of cases where someone died as a result of a boating accident, the *basic* cause was overloading or improper loading.

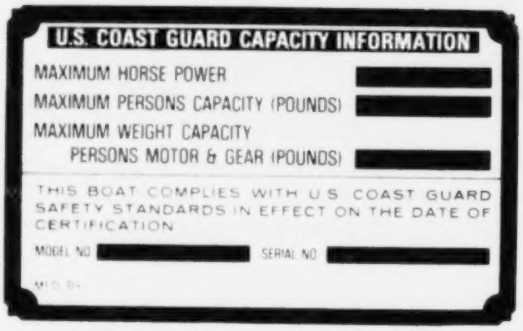
A boat's stability is affected by the weight and position of anything carried in it, and especially by people (and things) moving about when on board. This is especially true of boats 16 feet and under. Let's consider the three things you're likely to put in the boat that are going to affect its stability, flotation, and how it behaves underway.

The number of seats in the boat *are not* a reliable indicator of how many people you can safely carry. There are two good ways by which you can determine the number of people you can safely take in your boat. One of these is the boat manufacturer's capacity plate. All boats built after November 1, 1972, will have this plate. It looks like this:



U.S. COAST GUARD
MAXIMUM CAPACITIES
XX PERSONS OR xx LBS
XXX LBS PERSONS MOTORS GEAR
XXX HP MOTOR

Capacity Information Plate



U.S. COAST GUARD CAPACITY INFORMATION
MAXIMUM HORSE POWER
MAXIMUM PERSONS CAPACITY (POUNDS)
MAXIMUM WEIGHT CAPACITY
PERSONS MOTOR & GEAR (POUNDS)
THIS BOAT COMPLIES WITH U.S. COAST GUARD SAFETY STANDARDS IN EFFECT ON THE DATE OF CERTIFICATION
MODEL NO
SERIAL NO
MFD BY

Combination Capacity Plate and Certificate of Compliance

This plate is mounted so that it is clearly visible to the operator. Note that the capacity plate states the MAXIMUM number of people in LBS. that the boat can safely carry. It assumes that the engine is of the size recommended, that there is a *normal* amount of fuel, equipment, and supplies on board. It also assumes that wind, water, and weather conditions are nearly perfect. The final assumption is that the AVERAGE weight of people in the boat is 150 pounds each. That's a lot of assumptions. What it means is that YOU, the Skipper, must exercise some very careful judgement regarding how many people to take with you. *You* are still (and always) responsible.

As we said, not all boats have this capacity plate. If you have a boat that does not have a capacity plate, a small amount of simple arithmetic will provide you with a reasonable guide for the number of people your boat can safely carry. However the arithmetic to be used is based on the same assumptions that the capacity plate is. These assumptions bear repeating. They are: the engine you have is of a size (weight and horsepower) proper for your boat's hull, that there is a normal amount of fuel, equipment, and supplies aboard, that wind, water, and weather conditions are just about perfect, and that the average weight of the people in the boat is 150 pounds. With these conditions in mind then, the following arithmetic will give you a reasonable guide for the number of people you can take out on your boat. First, measure the overall *length* of your boat. Next, find the width at the widest part of the boat. When you have measurements which are not whole numbers of feet, express them in tenths of feet like this:

5 feet 6 inches = 5.5 feet
18 feet 9 inches = 18.75 feet

Now multiply the overall length by the width of your boat as measured. Finally, *divide* the result of that multiplication by 15. The number 15 is a constant and comes from the assumption that the *average* weight of the people in the boat would be 150 pounds. We just drop the zero so that our answer will be in people, not pounds.

Example

Suppose you had a Class 1 boat 18 feet long and 5 feet 6 inches wide. Then:

18 x 5.5 = 99
and dividing by 15 or,
99/15 = 6.6 people!

Obviously you cannot have 6 tenths of a people—so here's what you do. Round off 6.6 DOWNWARDS to the nearest whole number or in this case 6 people, and you pick up an added safety factor. For a drill, try this procedure out on *your* boat *now*. When you have done so, write the number on white tape and stick it near the operator's position on your boat as a reminder for safe loading.

More On Loading the Boat

You now have a good idea of how much you can put in your boat. Next let's talk about where and how to load the boat. Assume you've finished fueling after launching and you're tied up to a pier. Skipper, YOU get into the boat first. Step in—don't jump in. Have people on the pier hand you any gear. See that it is distributed evenly and stowed as much out of the way as possible. Any heavy gear that might slide around in the boat should be tied down or secured. A shifting load has killed more than one boater.

When all your gear is secured in the boat, then have your passengers step into the boat *one at a time*. Although the animals went aboard the ark two-by-two, remember, Noah's boat was on dry land at the time. In summary: when loading a boat distribute the load evenly, and don't allow people to stand up in small boats.

" KEEP A WELL BALANCED BOAT. "

Shown on the next page are some sketches of boats that are improperly loaded.

As Skipper, whenever you have any one of the conditions shown while you're underway–first slow down, then redistribute the weight carefully to maintain proper trim. Remember these four simple rules:

1. Distribute the load evenly.
2. Keep the load low in the boat.
3. Don't stand in small boats.
4. Never overload.

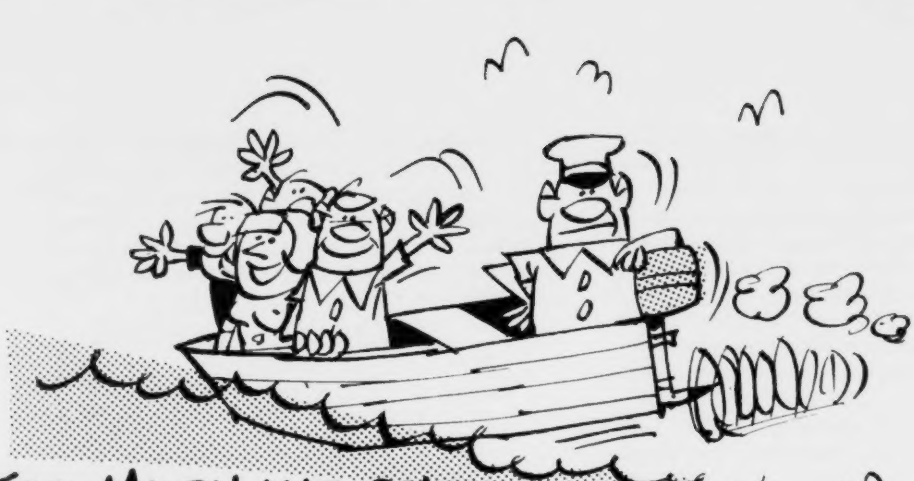
QUICK QUIZ: Loading

1. A capacity plate when mounted in a boat:
   - ☐ a. Gives the total weight capacity of people, gear, fuel, and engine.
   - ☐ b. The weight and horsepower of the recommended engine.
   - ☐ c. The number of people and horsepower of the engine.
   - ☐ d. The number of people only, based on an average weight of 150 pounds.

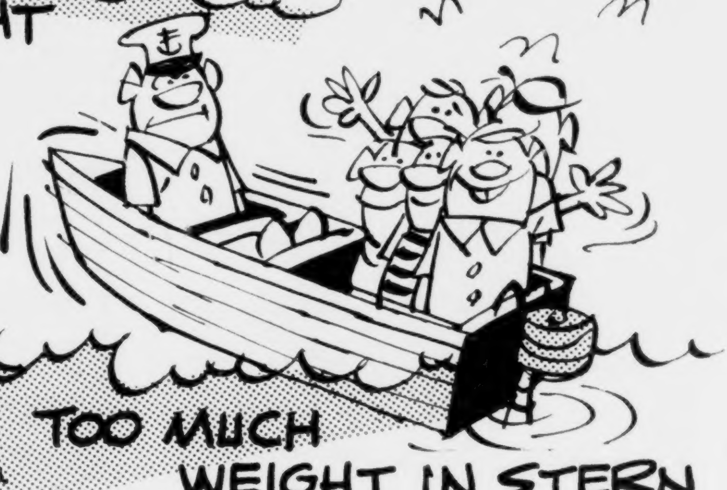
2. A capacity plate, when mounted in a boat, will be located:
   - ☐ a. Near the steering wheel and throttle visible to the operator.
   - ☐ b. Next to the engine serial number plate.
   - ☐ c. Near the back (stern) of the boat.
   - ☐ d. On the transom next to the engine.

3. A 20-foot boat with a 6-foot beam can safely carry:
   - ☐ a. 7 people. ☐ b. 8 people. ☐ c. 9 people
   - ☐ d. 10 people.

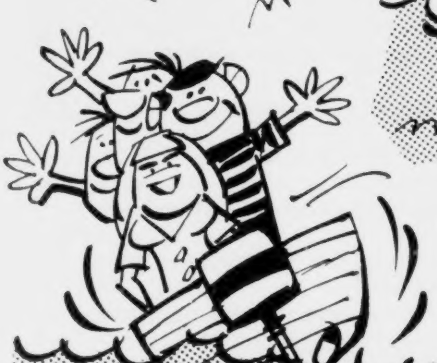
4. The primary cause of fatal accidents in boating is:
   - ☐ a. Overpowering with too large an engine.
   - ☐ b. Fire and explosions from improper fueling procedures.
   - ☐ c. Too great a speed in rough water.
   - ☐ d. Overloading or improper loading.



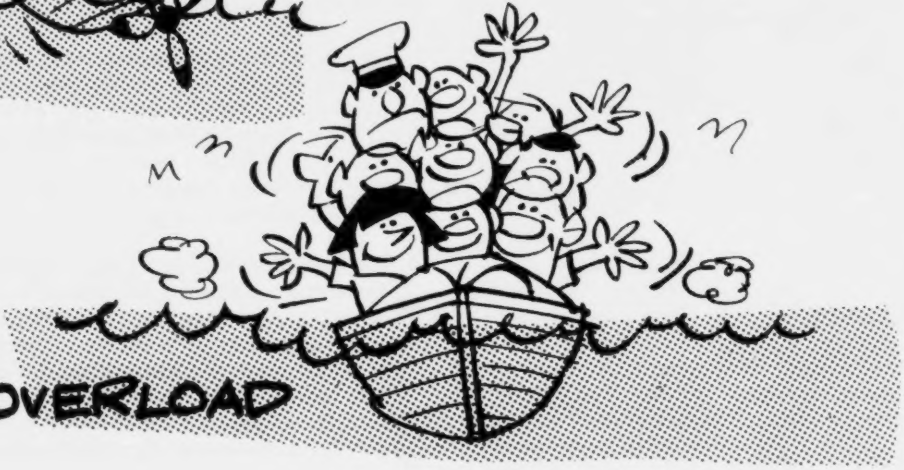
TOO MUCH WEIGHT IN BOW



TOO MUCH WEIGHT IN STERN



TOO MUCH WEIGHT ON ONE SIDE.



OVERLOAD

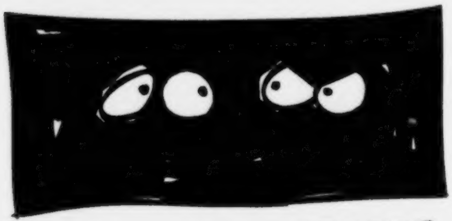
Check Equipment

Now that you've loaded the boat, check to see that your safety equipment is still accessible. Some of the equipment can use a quick working check. This will only take a minute so make it a habit.

First, PFDs—are they ready to grab? Check the straps to be sure they are secure and not torn. Make sure everybody in the boat sees them and knows how to put them on. A short drill with them (passengers and PFDs) won't hurt, especially if they have never worn a PFD before.

Second, fire extinguishers—are they aboard? In the proper rack or clamp? Can they be quickly removed for use? Is the clamp frozen with rust? Do your passengers know where they are and how to use them? Have you checked the pressure gauges to make sure they are fully charged and ready to use? Are the safety pins free to remove? Don't test your fire extinguishers by pressing the start lever—the valve may not reseat afterwards and all the pressure could leak out.

Third, are all fuel tanks stowed properly? Are the covers on tight? All spillage wiped up? Are the hoses connected properly to tank and engine (for outboards)? Have you checked for fuel leaks?



"I DID NOT FORGET THE FLASHLIGHT. I FORGOT THE BATTERIES"

Fourth, lights and horn. This is an easy, quick check—just try them out briefly. Spare fuses in the boat box? Spare lamps, bulbs, too? Is there a bell, plastic whistle, or hand-operated horn in the boat box in case the power horn fails?

Fifth, engine—is it down and locked (for outboards)? Is it set at the proper angle for the load in the boat? Are the fuel hoses connected tightly? Are the steering cables connected and tested? Did you remember to bring the ignition key (if used)?

Sixth, auxiliary equipment—not a legal requirement. Is the first aid kit in the boat and ready (full)? Bucket, bailer, or hand pump? Oar or paddle and boat hook? Spare propeller and shear pin (for outboard)? Anchor line and anchor? Mooring—tow lines? Flashlight (test it)? Distress signals (dry and ready to use)?

E. Part II Safety Afloat Review and Exercise

As before, this review and exercise is provided so you can check yourself on how well you have mastered this part of the program. We hope by now you recognize that we have tried hard not to waste your time with things that are "nice to know" about boating. The subjects to be learned are restricted to what we feel is "must know" information. We urge you, then, to complete the following review and exercise before tackling the next part of this program.

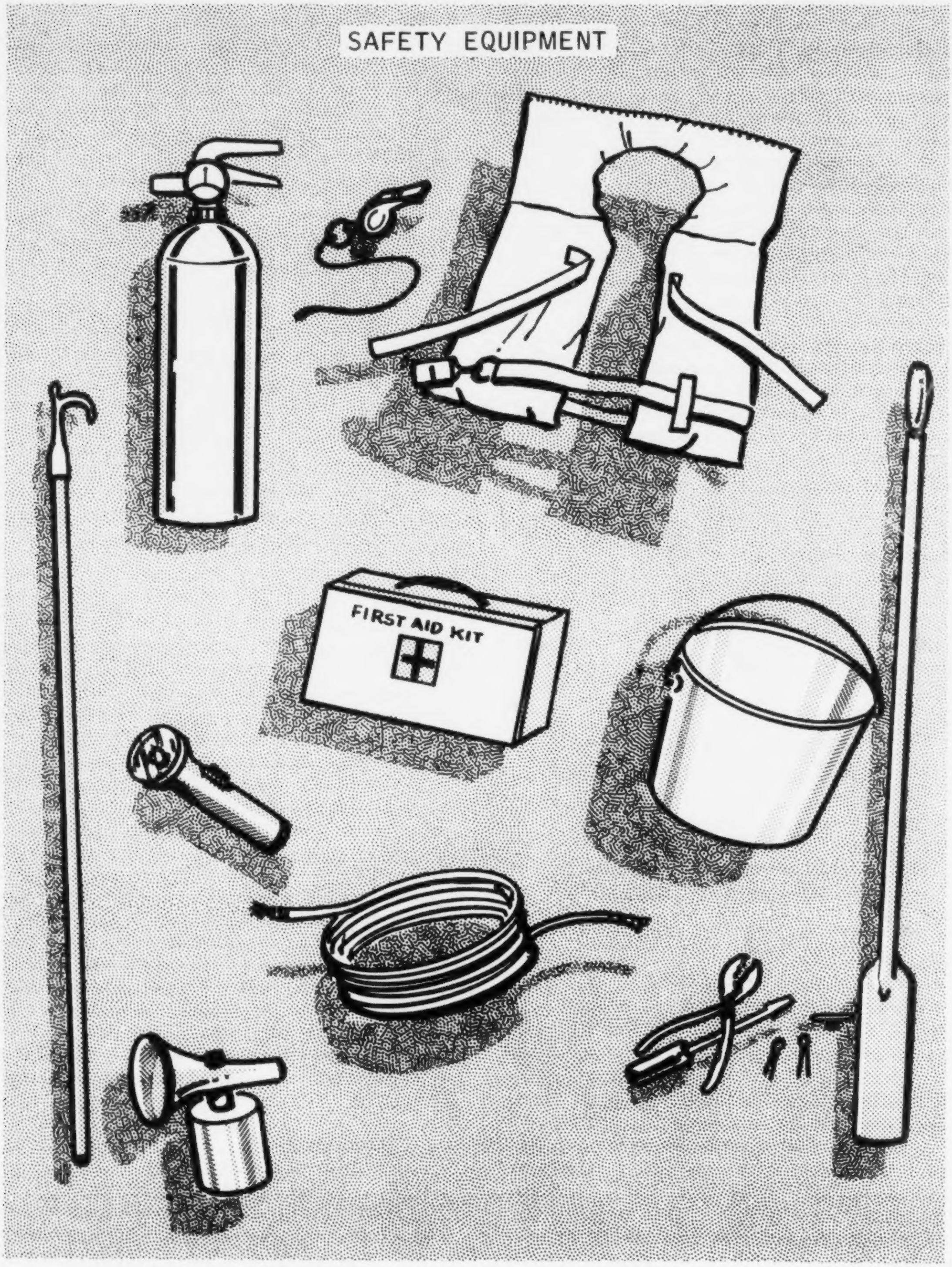
Review

In this part of the program you taught yourself the elements of presailing procedures such as sources of weather information, proper procedures for launching the boat, and procedures in fueling the boat and ventilation of dangerous fuel vapors. We closed this part with a lesson on the "Float Plan" where you learned that you should tell a relative or reliable neighbor (who can describe your boat) where you're going, when, who you have with you, and when you're coming back. Don't forget to cancel the Float Plan when you return.

In the part on making the boat ready, you learned the factors for loading the boat, and the difference between overloading and improper loading—remember—this is still the cause of most fatal boating accidents. We then covered equipment checking, accessibility and readiness for use, finishing with PFDs.

Exercise, Part II Safety Afloat

The following exercise is arranged in the format of situational problems. Read each problem carefully, then jot down your answer before you check the one given. If you look closely, you'll often find clues to the answer.



SAFETY EQUIPMENT

FIRST AID KIT

1. *Charlie Noble planned to go fishing first thing in the morning (well before daylight). Upon his arrival at the marina where he kept his boat, Charlie noted that although the sky was clear and the stars could be seen, it seemed pretty breezy. The wind speed indicator at the foot of the mast showed winds of 35 miles per hour. Looking up to the mariner's weather warning mast Charlie saw a signal that confirmed his worst fears. "Oh well," Charlie said to himself, "I was supposed to mow the lawn today anyway."*

Draw a sketch and describe the signal you think Charlie saw.

2. *Charlie Noble and his wife Zelda decided to trailer the boat up to the lake, try the new launching ramp, and take a cruise. Up to a point Charlie did everything right. However, as he was walking back from the parking area, he saw that Zelda was making frantic signals to hurry. "Charlie" she yelled, "The boat is sinking"! "Drat!" said Charlie, "I forgot to*

______________________________ ."

What do you think Charlie forgot to do?

NO, I DIDN'T FILE A FLOAT PLAN.
I THOUGHT YOU DID

3. *Ordinarily Charlie Noble was as safe a boater as could be. Today, however, Charlie made a mistake. It was a beautiful day but very hot at the fuel dock. Not a breath of air was stirring. During preparation and actual fueling he did everything right. When the tanks were full he tightened the covers and wiped up the small spillage immediately. As he carefully returned the fuel hose to its rack, he tossed the ignition key to Zelda saying "Here, warm up the engine while I pay for the gas."*

In view of the circumstances what do you think Charlie's mistake was?

____

____

____

4. Charlie and Zelda planned to go boating on the lake. "Zelda," Charlie said "You pack the lunch while I go over and tell Irving where we are going." Charlie's friend, Irving Plimsole, was in his home all that day to classify his wagon wheel collection. While waiting his turn at the fuel dock, Charlie overheard a group of boaters talking about the great trip they had just returned from. The trip was up the length of the lake and, through the connecting river. "That sounds like a great trip," Charlie said to himself, "I think I'll do it," and he did...and he committed another boating boo boo.

What do you think it was?

____

____

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____

5. On the way back to the Marina, Charlie and Zelda stopped at a little beach for a swim and an early supper. The beach was covered with driftwood which Charlie thought would make great firewood (and the price was right). "Hey, Zelda" he said "get in the boat and help me load a mess of this driftwood to take home for firewood." "Gadzooks" said Zelda (she had an unusual vocabulary you see) "that's a good idea Charlie." Not wanting to damage their PFDs with the wood, Zelda carefully put the PFDs in the bow cuddy. Working quickly Charlie and Zelda soon had a heaping pile of driftwood in the boat.

They committed two unpardonable sins, what were they?

____

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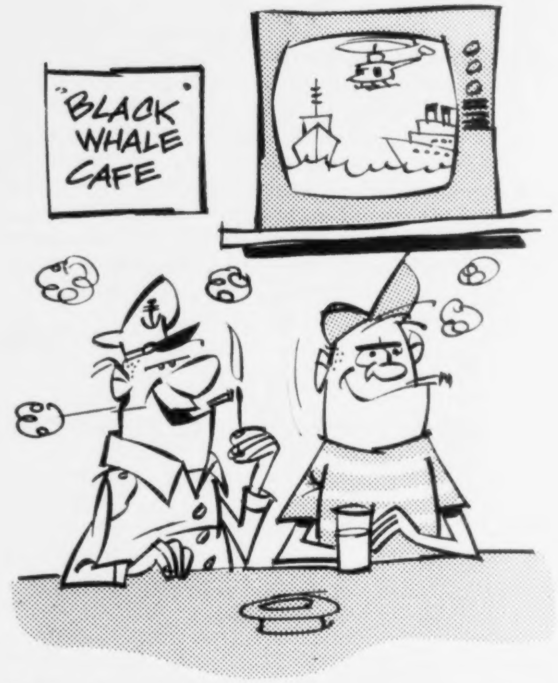


"DON'T LET ME FORGET TO CANCEL OUR FLOAT PLAN WHEN THIS JOINT CLOSES."

PART III, UNDERWAY

A. Rules of Operation

1. On-the-Spot Corrections

Under the Public Law 98–89 the Coast Guard, when observing a boat operating in an unsafe condition (say, grossly overloaded) can "terminate" that boat's trip by directing the boat to the *nearest* dock (or safe area) and have it stay there until the condition is corrected.

2. Negligent or Grossly Negligent Operation

If a Coast Guard Boarding Officer observes a boat being operated in a negligent or grossly negligent manner (for example, pulling a water skier through a busy swimming area) this could result in a fine or jail! The difference between negligent and grossly negligent operation is a matter of the operator's knowledge of the risk of harm. (Speeding in an obviously posted swimming area could be viewed as grossly negligent and could result in either a fine, jail, or both.) You are responsible for learning and observing all rules and regulations regarding the safe operation of your boat. The following subjects are primarily concerned with the operation of your boat—so study them carefully.

Defensive Boating

Safe boating involves the ability to operate a boat in such a manner as to avoid being involved in a **PREVENTABLE** accident. Like other accidents, most of those involving boats are preventable. Defensive operation is the key to safe boating. You may be an outstanding mariner, but what about the other guy! Defensive boating is the prevention of accidents in spite of the actions of others or the presence of adverse conditions. If another boater creates a hazardous situation it may be necessary to depart from standard procedures under the Rules of the Road just to avoid an accident. In fact, such a situation is recognized and authorized under both the International and Inland Rules. These decisions require good judgement and alertness on your part, much the same as driving on the highway.

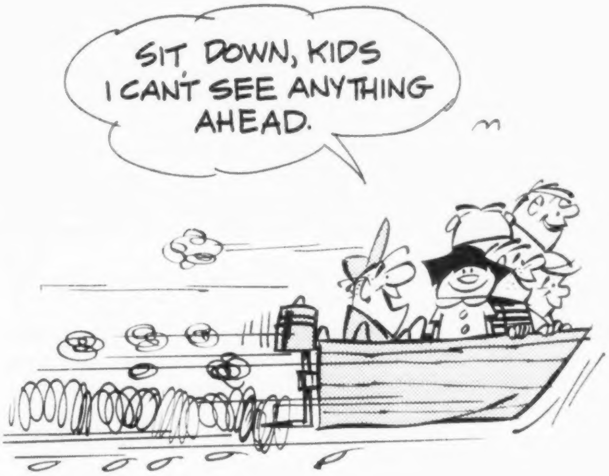
Drinking and Boating

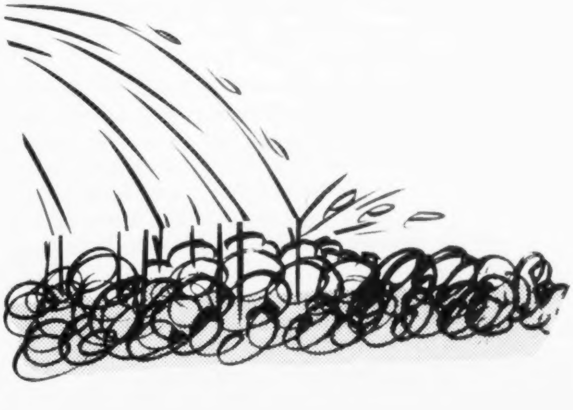
We have discussed some of the requirements for the boat that will help make a safe outing. A factor often overlooked is the condition of the boat operator. The most seaworthy and best equipped boat will be next to useless if the skipper is not "up to snuff."

Just a few hours of sun, wind, glare, noise and vibration can tire boat operators enough to allow them to miss important things around them which could cause an accident. Operators need to be aware of this and make a special effort to be alert and to avoid other boats, snags and floating debris after a day on the water.

In addition, any alcohol comsumed will interact with this fatigue and the resulting reduction in ability to observe and react is greater than with each alone. Alcoholic beverages have their place as relaxants and a social lubricant, but not while on the water. Responsible boat operators save their drinks until they get home.

It is important to remember too, that operating a vessel while under the influence of alcohol is a federal offense, punishable by a civil fine of up to $1,000 or a criminal fine of up to $5,000. Also, many states are enacting or toughening their own "Boats and Booze" laws.


SIT DOWN, KIDS I CAN'T SEE ANYTHING AHEAD.



Accidents-Legal Requirements

Boaters, as a group, usually help each other out during an emergency situation, with having to be told to. But, did you know that skippers are **obliged** to assist other boaters in trouble provided that they, their passengers, or their own boat is not put in jeopardy by doing so? A failure to comply could even result in a stiff fine, imprisonment or forfeiture of their boat.

Skippers who respond to the "Good Samaritan" requirement in good faith, without objection of the distressed individual are not liable for damages as a result of rendering assistance, provided thay acted in a reasonable and prudent manner under the circumstances.

3. Accident Reporting

If you learn and practice all of the safety points in this program there's a good chance you may never have to fill out and send in an accident report. However, not *all* accidents are avoidable by your action alone. In this case you might have to fill out an accident report. This is required by law. There are four conditions that require you to fill out and send in a boating accident report. These are:

1. When a life is lost due to the accident.
2. When someone is injured and requires medical attention beyond first aid.
3. Damage of more than $200 to property (including boats) or complete loss of a vessel.
4. A person disappears from the vessel under circumstances that indicate death or injury.

If these seem general to you, remember it's best to file a report if you have any doubt. If anyone died you *must* file a report with 48 hours of the occurrence if a person dies within one day (24 hours) of the accident. You must also file a report within 48 hours if a person is injured and required medical treatment beyond first aid and within 10 days of the occurrence or death if an earlier report is not required. Some states may require reports for less serious accidents, so be sure to check out the laws in your state.

If you ever have to file an accident report, you must obtain the required reporting form and file it with the state where the accident occurred. The reporting form is available at state agencies or Coast Guard offices.

Under the Public law 98-89 manufacturers of boats and associated equipment (engines) built on or after 11 August 1971 are directly responsible for assuring that their products are free of serious safety related defects, and that they comply with applicable Federal safety standards or regulations. If a Coast Guard investigation reveals that a reported safety related defect extends to other boats, the manufacturer will then be REQUIRED to notify all owners and take appropriate corrective action. If you experience a serious problem which may have been the result of a defect in design or construction contact your nearest Coast Guard District Office.

The information you provide may prevent serious boating accidents endangering other boaters.

QUICK QUIZ: Operation

1. Falls from a slippery floor or deck are always a hazard in boats. Suppose someone fell in your boat, badly spraining his ankle. If he were to be laid up for a week with this injury what is your responsibility with this matter?

____

____

____

____

2. Operator fatigue is caused by sun, wind, glare, noise or vibration and is compounded by ______________.

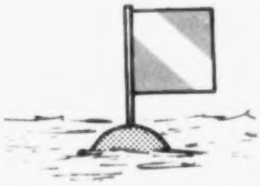
B. Hazardous Areas

1. Dams

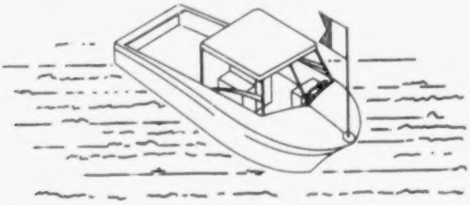
While some Skippers may never operate a boat near a dam, many others will, and all should be aware of the hazards involved. Areas that are immediately above and below dams are very dangerous to small boats and you must stay clear. Observe and obey all signs and instructions. At some dams where there is an open spillway, a boat that gets too close could be trapped and swept over the dam. If the dam is part of a hydro-electric power plant there may be areas of extreme water turbulence just below the dam. Very often these power plants operate on a "demand" basis. That is, it might be perfectly calm water just below the dam—then all at once somebody opens a giant valve and there's a raging torrent of water coming out that would capsize any boat. Even people with PFDs on could be dragged under and drowned.

2. Skin Divers

Skin diving is a rapidly growing sport and as you might expect much of it takes place in areas of recreational boating. While operating your boat you must keep a sharp lookout for skin divers. Some dive from a boat while others swim out from shore. Divers will usually display the flag shown in the sketch below:



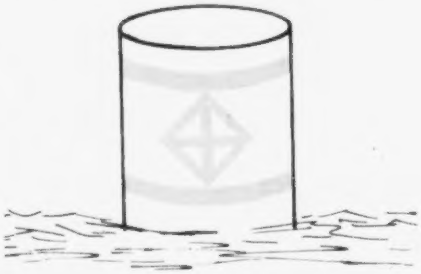
Sometimes this flag is attached to a small floating buoy or an inflated innertube. When divers are operating from a boat, and that boat is restricted in its ability to maneuver, the Navigation Rules require it to display a rigid replica of the international code flag "A" not less than one meter in height (when it is impractical to show the shapes otherwise required for vessels restricted in their ability to maneuver). See the sketch below. Be aware that the "A" flag is a navigation signal advertising the vessel's restricted condition.



It does not pertain to the diver, as the commonly used red and white diver's flag does. In all cases stay well clear and watch closely for air bubbles in the water. Slow down and be prepared to stop the engine instantly. Learn to identify and know what to do whenever you spot the warning signals.

3. Special zone areas

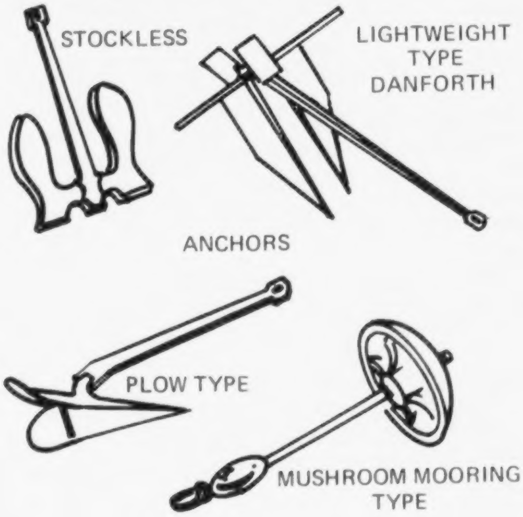
Just like the divers flag there are other zoned areas that you should stay clear of. For example, study this symbol for a moment:



You may see this symbol on a buoy, signboard, or flag. Its meaning is simple; it's an area reserved for swimmers and boats should **STAY OUT!** This symbol may also mean **DAM, WATERFALL, RAPIDS,** etc. and in general means **BOATS KEEP OUT!!!**

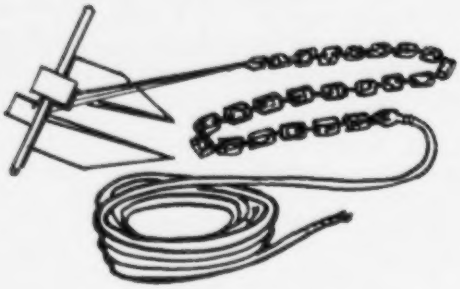
C. Anchoring

Choose the right anchor for your boat and the type of bottom you expect to be anchoring in. Shown below are sketches of some different anchors.



ANCHORS

The ground tackle assembly consists of the anchor, a short length of chain, various shackles or connectors, and the rode (a light line used for a boat's anchor). Shown below is a sketch of anchoring gear ready for use.



GROUND TACLE (MADE UP)
DANFORTH ANCHOR SHOWN

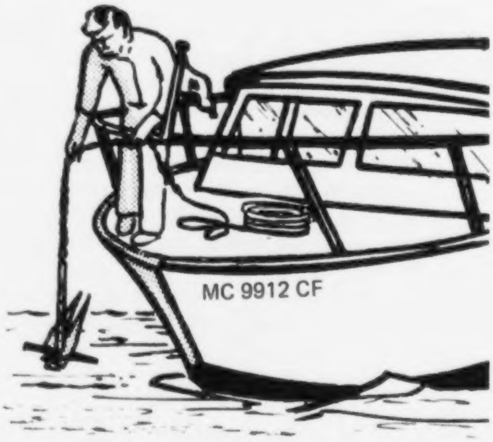
Coming up to anchor

Use some care in selecting the spot to anchor. Boats already anchored own that spot and can't be expected to move so pick a spot that's well clear (even after paying out your anchor line). If available, use buoys as reference points or, if close to shore, use a prominent land feature. Slow down to bare headway, keeping the bow into the wind and/or current, whichever is strongest. As you approach the anchoring point bring the engine to neutral and drift into position. When your boat is dead in the water, let the engine idle in neutral. *Lower,* do not throw, the anchor over the side. Throwing the anchor often causes it to foul with parts of the rode. After the anchor is on the bottom pay out the anchor line gradually as the boat drifts back from the anchor point due to wind or current. As a general rule, pay out five to seven times as much anchor line as you have depth of water. If the wind or current is fairly strong, you may have to increase the amount of line you pay out (called the "Scope"). In some cases, (i.e., heavy weather-strong current) you may need a scope of as much as seven times the depth of the water. Take a couple of turns of anchor line around the anchor bit or cleat and tie your favorite hitch—you know—the one that's easy to cast off. Above all keep your feet and legs well clear of the anchor line.

Anchoring by the stern

Every year many boats capsize and several people die because of anchoring by the stern. The accident scenarios are distressingly similar. A fisherman decides to move to a new spot. He is in a small boat, sitting in the stern with the outboard motor, gas tank, tackle box and the anchor over the stern. The operator stands up to retrieve the anchor and suddenly "a freak wave" comes over the stern and swamps the boat.

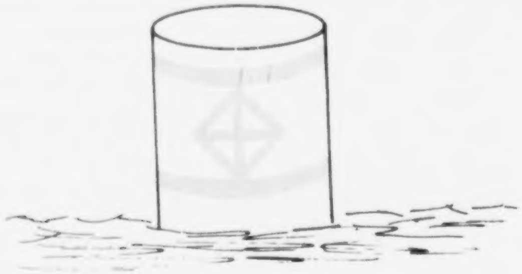
A boat is constructed so that the bow is designed to ride over and on top of the water. The stern is not. When the stern is facing the current, the pressure of the current is pushing one way against the bottom of a flat surface while the anchor line is holding the top of the same flat surface against the current. This lever action greatly increases the tension on the anchor line which in turn pulls the stern deeper into the water. When retrieving the anchor, the pull on the anchor line increases the pressure pulling the stern deeper into and sometimes under the water. Therefore, anchoring should only be from the bow which is designed to ride over the water regardless of the speed of the current.



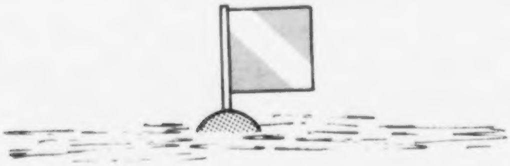
DROPPING ANCHOR

QUICK QUIZ: Anchoring

1. Complete the following statements:
   An accident report must be filled out and submitted when:
   a. As a result of the accident a ________ is lost.
   b. When anyone is injured and requires ______________________ .
   c. Property damage is in excess of ___ dollars.
2. When you see this sign on a buoy it means ______________ .



3. When you see this signal on a float it means: __________ .



4. When anchoring your boat, never throw the anchor because it might ________ .
5. After the anchor has a bite (digs in) you will normally pay out anchor line (scope) __ to __ times the depth of water.

D. Emergency Procedures

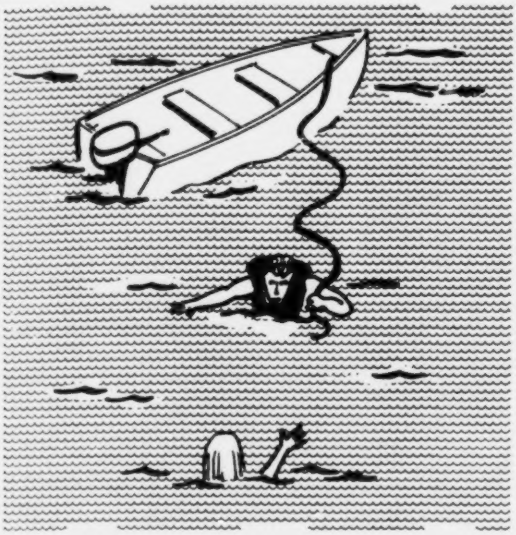
1. Man overboard

The second greatest cause of fatal boating accidents is falling overboard. Many of these accidents happen when the boat is moored. The passengers often haven't had time to adjust to the unstable footing conditions in most small boats. Falling overboard can also be caused by unsafe practices such as sitting on outside decks or gunwales (edges of the boat), or standing or moving about without holding on. There's an old seafaring rule that applies here: That is, "one hand for the ship, and one for yourself" meaning "Hang on." Making high-speed, tight turns without warning your passengers, slipping on slippery surfaces or just plain horseplay are other causes.

If somebody falls overboard the first thing to do is get something that floats into the water near the person that he can hang on to. A PFD is *best* but don't delay to hunt for one. An empty gas tank, a styrofoam icebox, or an oar all float and would help keep the victim afloat until you can get something better to him.

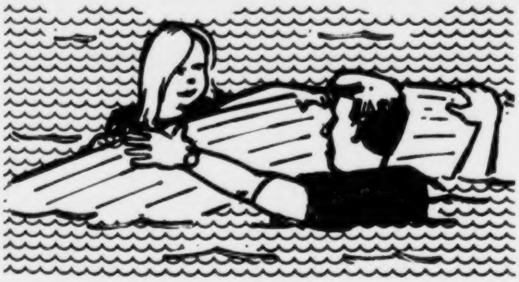
THROW THAT ANCHOR OVERBOARD AND QUIT ROCKING THE BOAT, ED

There are two basic methods you can use to get them back into the boat safely. The first is self-rescue. Stop the boat dead in the water and have the victim swim to the boat. He can see the boat, and with the motor turned off you can talk to him. If the person is hurt or unconscious, or for some reason can't swim to the boat a second rescue method is used. If the victim is able to grasp and hold a line, maneuver the boat upwind, close to the victim and turn off the engine. Then throw the victim a line and pull him alongside. If the victim is unable to grasp and hold a line, maneuver the boat upwind from the victim, turn off the engine and let the boat drift down on him. As the boat drifts alongside the victim, take any action necessary to retrieve the victim without aggravating or causing any injury. Always keep the operator's side of the boat alongside the victim. NEVER retrieve anyone from the water with the engine running. The propeller of an idling engine can still turn fast enough to cause an injury even when it is in neutral. Only as a last resort should you put a man in the water and only then if he has a PFD on.

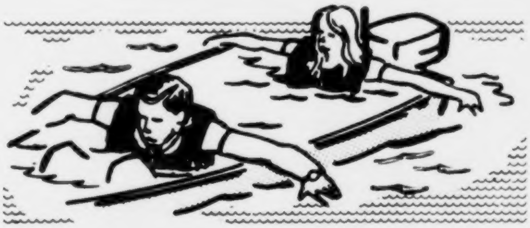


2. Capsizing

This is the number one killer in boating accidents and the primary cause is overloading or improper loading. It *can* happen for other reasons so you must know what to do. First, *stay with the boat.* Most



small boats continue to float even when turned over or full of water. Because of the extra flotation built in, the boat will normally float even with the engine still attached to the boat. There's always the temptation to immediately swim ashore. But, when you're in the water you can't correctly judge the distance to shore. It's usually two or three times further than it looks. In addition, you should stay with the boat because it can be more easily seen by other boats and aircraft. Hang onto the boat and if they aren't already wearing them, get everyone into a PFD. Once you have done this you must *coolly* evaluate the situation. It is often possible to right a small boat, get back in, and get it closer to shore using oars, paddles, or hands. Finally, be ready to give a distress signal—but save your signals until it's evident that there's a good chance somebody will see it.



3. Fire Afloat

A fire afloat is a very harrowing experience—ashore you can usually get away from it—but in a boat you are trapped. When the fire is on wood, mattress, or rags, put it out with water using your bailing bucket (another good reason to carry one), also there's plenty of water around. If the fire is in loose materials it may be best to simply heave them over the side into the water. If the fire is oil, grease, or some kind of fuel you'll have to use your fire extinguisher. Point the nozzle at the base of the flames. A simple fact to remember is that a fire must have fuel, air, and heat. Take away any *one* of the three and it *must* go out.

If you're underway and a fire starts, stop the boat—keep the wind (if any) blowing away from the boat. If the fire is in the back of the boat, head into the wind—if in the bow of the boat, head away from the wind. Finally, keep your fire extinguishers ready at hand and check their pressure gauges each time before you go out.

If an explosion or fire forces you into the water, get everyone into PFD's, stay together and get clear of the boat. Use any floating debris available to help keep you afloat.

QUICK QUIZ: Emergencies

1. The second greatest cause of fatal boating accidents is:
   ________________ .
2. The *first* thing to do when somebody falls overboard from your boat is to:
   ________________ .
3. The number one cause of fatal boating accidents is ________________ and is due to overloading or improper loading.
4. If your boat ever capsizes, always ________________ with the boat.
5. A fire must have three things in order to burn. These are:
   a. ________________________
   b. ________________________
   c. ________________________

4. Lost

Daniel Boone once said that he had never been lost in the forest but he did admit that he had been confused for several days. There *could* be times when you, too, could be confused—or if you want to come right out and say it—"Lost." For example, you might be out fishing some day when a thick fog rolls in and you lose your bearings. Without references, there's a good chance you'd soon be confused if you tried to go back in to port. In a situation like this don't try to go back in. If you're anchored—stay anchored. If it's too deep to anchor, make up and put out a sea anchor. That is, tie a line to your bailing bucket or an empty portable gas tank. Fill it with water and secure the line to the boat's bow cleat. Use anything that will drag and keep you from drifting. Maintain a sharp lookout all around. "Get out your whistle, bell, or horn and make a correct fog signal–one prolonged blast (4–6 sec.) at intervals of not more than two minutes as prescribed in the Navigation Rules (vessels at anchor—5 sec. of rapid ringing with a bell, not more than one minute apart).

SEVERAL DAYS ARE UP AND I'M STILL LOST

Remember this—if you filed a Float Plan someone knows about where you are—and if they report you overdue—we'll come looking for you! If you have a marine chart of the area you're in, and a boat compass, it's really very difficult to be truly lost. If you do have them and you are lost (for the moment), take the time to study your chart. Then lay out your compass course to the nearest point you know you'd recognize. The rest should be easy. Look at it this way. On his first voyage to the new world Columbus was lost for many, many days. But he believed in his compass, steered a fixed course, discovered the new world, and *found his way home*.

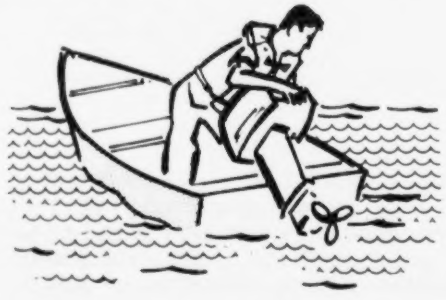
QUICK QUIZ: Lost

1. If you are planning to take your boat into unfamiliar waters you should study a ________________ of the area.
2. While not required by law, a useful piece of equipment to use in low visibility is a ________________ .

"OH, OH, HERE COMES TROUBLE!"

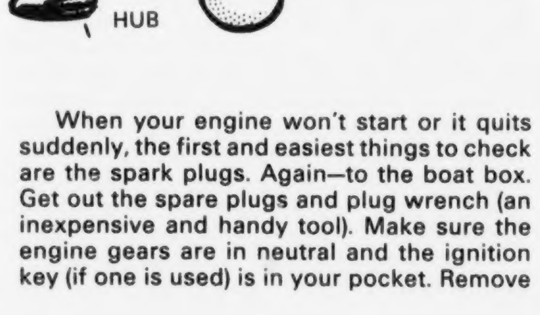
5. Disabled

Usually when a boat is disabled, it is due to some sort of trouble with the engine. For most engines there are three "soft" spots where the trouble is likely to occur: the fuel system, the electrical/ignition system, and the drive train (propeller, shear pin, etc.). In the case of outboard engines, drive-train trouble usually happens when, in shallow water, the propeller strikes bottom or a rock breaking the shear pin (The shear pin is designed to break which prevents serious damage to the engine). This becomes evident as the engine races with no forward motion of the boat. When this happens shut off the engine and put the ignition key in your pocket. Anchor your boat so you won't drift into shallow water. Get out your boat box with spare shear pins and cotter keys and a pair of pliers. Release the reversing locking lever, make sure the engine is in neutral gear, and raise and lock the engine so that the propeller is out of the water.

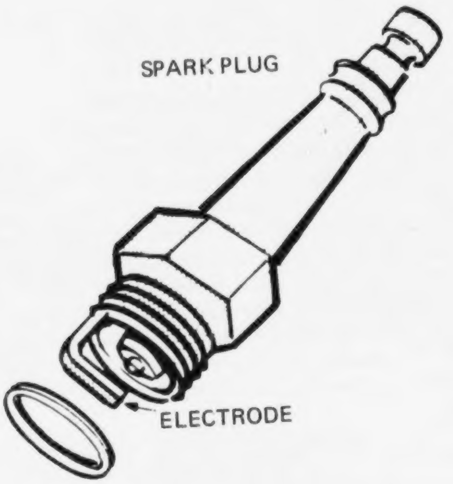


RAISE OUTBOARD

With the pliers straighten and remove the propeller hub cotter key. It may be necessary to slide the propeller from the drive shaft to remove the broken shear pin. Replace the propeller on the drive shaft and line up the shear pin holes in the propeller and drive shaft. Be careful not to drop the new pin in the water. Insert the new shear pin. Replace the propeller hub on the drive shaft. Replace and bend the new cotter key. Wise skippers carry two spare pins *and* a spare propeller since propeller blades do break off occasionally.



When your engine won't start or it quits suddenly, the first and easiest things to check are the spark plugs. Again—to the boat box. Get out the spare plugs and plug wrench (an inexpensive and handy tool). Make sure the engine gears are in neutral and the ignition key (if one is used) is in your pocket. Remove the engine cover. Detach the plug leads and remove the plugs. Inspect the plug electrodes. If they appear oily or black with carbon, replace them with spare plugs. If you don't have a spare plug, try cleaning the electrode. If the plug is OK, check to see that the metal plug gasket is in place and put the plug back in. Look for corroded, dirty, damaged, or loose connections. Check for broken or damaged spark plug wires. Also, check the wiring between the coil and the distributor cap. Dry any wet wiring or connections. If the engine was overheated it may not start until it has cooled.



WARNING: Before attempting any electrical repairs, make sure bilges and engine compartments are free of explosive vapors.

Fuel problems—check tank. Always check your fuel before leaving the dock. A good rule to follow is never cruise farther than one third of your fuel supply will take you. Save one third for the return trip and one third for reserve. If there is plenty of gas in the tank, check lines and filter on the fuel pump. If no gas is in the bowl the trouble may be a clogged or poorly connected fuel line. Make sure the gas tank vent is open. Remove the sediment bowl and clean the filter, replace the filter and bowl. Disconnect the coil wire from the distributor. Remove the fuel line from the outlet side of the fuel pump and crank the engine. If no fuel comes out of the pump—the pump is the trouble. If fuel is present, reconnect the fuel lines to the carburetor and remove the spark plugs. Caution: Do not allow gasoline to spill into the boat. If the plugs are dry (no fuel on them) the trouble is in the carburetor. Check the choke on the carburetor. Check the adjustment of the main jet.

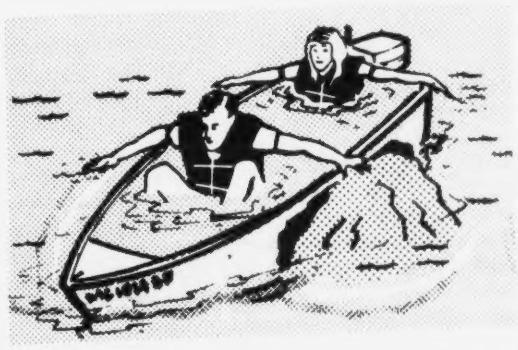
If the plugs are wet the engine may be flooded. Open the throttle wide, put the choke in the full-open position, and with the ignition on, crank over the engine. This draws only air through the engine and will quickly dry it out.

QUICK QUIZ: Repairs

1. Trouble is most likely to occur in a gasoline engine in one of three (3) systems. These systems are:
   a. ______________________________
   b. ______________________________
   c. ______________________________
2. The outboard engine is usually protected from damage by a
   ____
   ____
3. A good rule to follow on fuel supply is to use ______________ of the fuel for the trip out and reserve the rest for the trip home.

6. Aground

If you boat in shallow lakes and streams, in tidal waters, or in any area where water level is subject to change, there's a chance you might run aground. As in all emergency situations the first thing to do is keep your cool. Usually, your first impulse is to shift immediately into reverse, gun the engine, and attempt to back up. This could be the wrong move. If you were aground on sand or mud the propeller spinning in reverse might pull more sand and mud under the keel making matters worse. Instead, with an oar, paddle,



or boat hook test the bottom all around the boat. If the bottom is shallow and sandy and it's safe to do so, get a couple of people into PFDs and out of the boat and push it off. You might get results by having your passengers move and shift their weight. If you've run up on a rock or something solid, check to see if the boat has been holed before you try to back off. It might be wiser to keep the boat on the rock until you're ready to stuff something into the hole. A PFD, mattress, or blanket jammed into the hole may help long enough to get to shore. If the hole is too big, get all hands into PFDs and stay with the boat. It's not going to sink right away if at all. There's extra flotation in most boats—you and your passengers can hang on until help arrives.

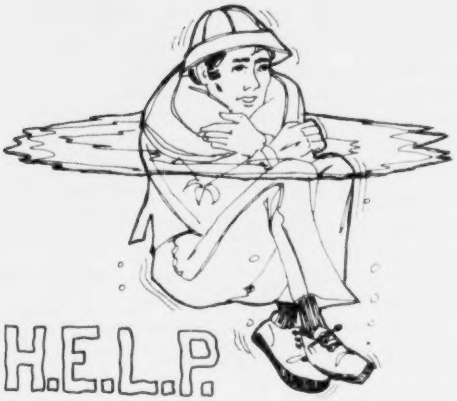
QUICK QUIZ: Aground

1. If you ever run aground in mud or sand, first check the ____________ of the ____________.
2. It is often possible to get off from running aground by shifting ____________ in the boat.
3. Never get out of the boat to push off without first ________________ the bottom and putting on a PFD.

7. Hypothermia – What is it, and how does it kill?

Hypothermia is subnormal temperature within the central body. When a person is immersed in cold water, the skin and nearby tissues cool very fast. However, it may take 10 to 15 minutes before the temperature of the heart and brain starts to drop. When the core temperature drops below 90°F. serious complications begin to develop. Death may occur at about 80°F.; however, a person may drown at a higher temperature because he loses consciousness or loses the use of his arms and legs.

Survival in cold water depends on many factors. The temperature of the water is only one. Others include body size, fat, and activity in the water to name a few. Large people cool slower than small people. Fat people cool slower than thin people. Children, because they are small, cool faster than adults.



By swimming or treading water, a person will cool about 35% faster than if remaining still. The "drownproofing technique" taught in many survival swimming classes requires putting the head into the water. Because the head is an area of high heat loss, drownproofing will cause a person to cool about 80% faster than if he kept his head out of the water. Drownproofing thus reduces survival time by as much as one half in cold water.

An "average" person, wearing light clothing and a PFD, may survive 2 1/2 to 3 hours in 50°F. water by remaining still. This survival time can be increased considerably by getting as far out of the water as possible and covering the head. Getting into or onto the boat or anything else that floats can be a real life saver. The following table shows predicted survival times for an average person in 50°F. water:

Predicted Survival

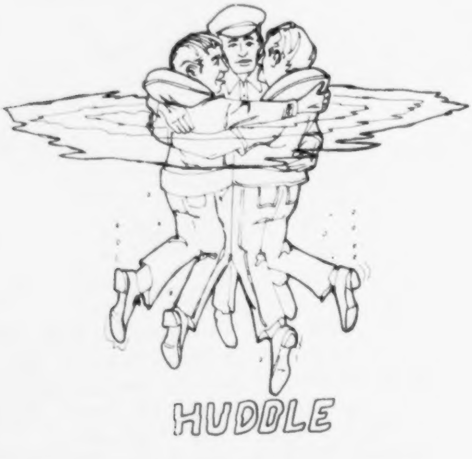
Situation	*Time (Hours)*
NO FLOTATION	
Drownproofing	*1.5*
Treading Water	*2.0*
WITH FLOTATION	
Swimming	*2.0*
Holding-still	*2.7*
H.E.L.P	*4.0*
Huddle	*4.0*

In case of accidental immersion in cold water, remember that water conducts heat many times faster than air. Most boats will float even when capsized or swamped. Therefore, get in or on the boat to get as far out of the water as possible. Wearing a PFD is a MUST. It will keep you afloat even if you are unconscious. Remaining still and, if possible, assuming the fetal, or, heat escape lessening posture (HELP), will also increase your survival time. About 50% of the heat is lost from the head. It is therefore important to keep the head out of the water. Other areas of high heat loss are the neck, the sides and the groin.

Note: It is impossible to assume the HELP position while wearing some PFD's. However, even a partial HELP position gives some protection to the high heat loss areas, thus increasing survival time.

If there are several people in the water, huddling close, side to side in a circle, will also help preserve body heat.

Placing children in the middle of the circle will lend them some of the adult body heat and extend their survival time.



First Aid for Hypothermia Victims

1. Make sure the victim has an open airway and is able to breathe. Then, check for respiration and pulse. Respiration may be slow and shallow and the pulse may be very weak. So check these vital signs very carefully. If there is no pulse or respiration, CPR must be started immediately.
2. Prevent further heat loss:
   a. Gently move the victim to shelter and warmth as rapidly as possible.
   b. Gently remove all wet clothing; cut it away if necessary. The feeble amount of heat energy the victim has left must not be expended on warming and drying wet clothing.
   c. Dry the victim carefully (do not rub his skin) and wrap him in blankets or a sleeping bag. If available, place warm water bottles or other gentle sources of heat under the blanket on the victim's neck, groin, and on the sides of his chest.

3. Transport the victim to a hospital as soon as possible. Only a physician should determine when the patient should be released.

Incorrect treatment of hypothermia victims may induce a condition known as "After-Drop". "After-Drop" is a continued fall in the victim's core temperature even after he has been rescued. This is caused by improper rewarming, allowing cold, stagnant blood from the extremities to return to the core of the body. When this cold blood returns to the core it may drop the core temperature below a level which will sustain life. For the same reason, hypothermia victims must be handled gently and should not be allowed to walk.

DO NOT:

1. Place an unconscious victim in a bath tub.
2. Give a victim anything to drink, including hot liquids and especially alcohol.
3. Rub the victim's skin, especially do not rub it with snow.

8. The Principles of First Aid

The following four principles of first aid present a brief outline for learning and retaining the essential knowledge and skills in first aid. Memorizing these principles will also assist you in knowing how to act and in what order to act if you encounter a situation requiring first aid:

1. Check and Clear the Airway.
2. Stop the Bleeding.
3. Protect the Wounds.
4. Treat for Shock.

Check and Clear The Airway

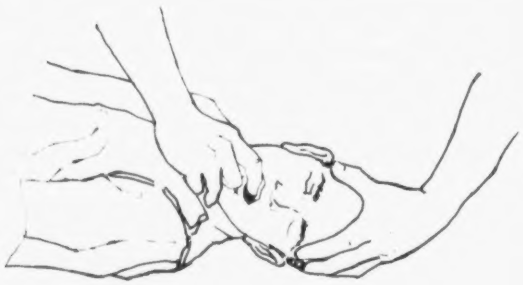
Resuscitation is a general term which covers all of the measures taken to restore life or consciousness to an individual who is apparently dead. These measures include artificial respiration to restore normal respiratory function, and closed chest heart massage to restore normal heart beat. Time is of prime importance. SECONDS COUNT. If a person stops breathing, he can suffer permanent brain damage within 4-6 minutes. Mouth-to-mouth or mouth-to-nose artificial respiration should be started at once in any case where breathing has ceased.

Only after artificial respiration has been initiated and after it has been determined that the heart has stopped, should external heart massage be started and combined with artificial respiration to give cardiopulmonary resuscitation.

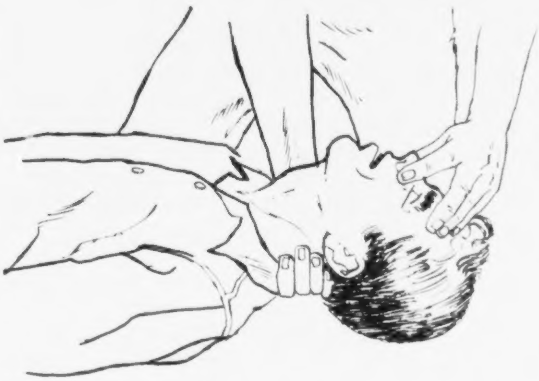
The following techniques should govern cardiopulmonary resuscitation (C.P.R.) procedures:

Mouth-to-Mouth Breathing

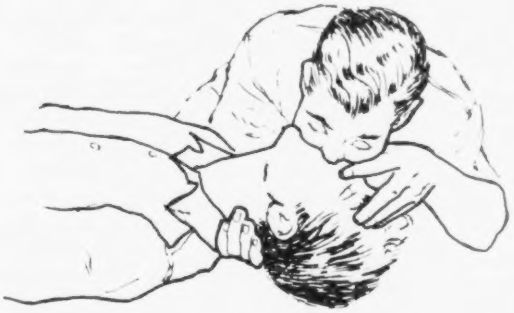
1. This is ALWAYS started first as soon as the need is recognized, and then the necessity for external heart massage is determined.
2. Place victim on his back.
3. Kneel beside the victim's shoulder.
4. Clear the victim's mouth and air passages of foreign objects, i.e., chewing gum, dentures, seaweed (drowning victim), etc.



5. Place one hand under victim's neck.
6. Place other hand on victim's forehead so that thumb and forefinger can close the nose.
7. Lift gently with hand under neck while pushing down with hand on forehead. This will extend the neck and open the air passages in the vast majority of cases.



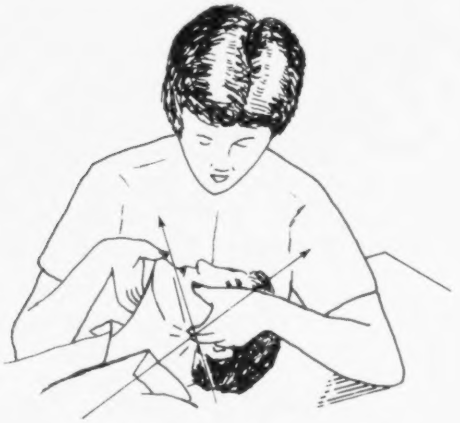
8. Initially, give the victim four (4) quick breaths without interruption, then take a deep breath (about twice the normal), open your mouth wide, place your mouth over the victim's mouth and blow.



9. Watch for victim's chest to rise. As soon as this happens, remove your mouth from the victim's and allow the air to expire naturally from the victim's chest.
10. Repeat 12 times a minute for adults (every 5 seconds), 18-20 for children and infants, (every 3 seconds).
11. If the chest does not rise, one or more of the following conditions exists and must be corrected:
    a. Airleak. Make sure that there is an airtight seal between your mouth and the victim's and that the seal on the victim's nose is secure.

b. Airway obstruction (more likely).
   (1) Insert your finger in the victim's mouth and remove any foreign objects (false teeth, etc.), vomit and/or blood clots.
   (2) For adults — see section on "Choking Accidents".
   (3) For children — Roll infant over your forearm and give a sharp blow between the shoulder blades.

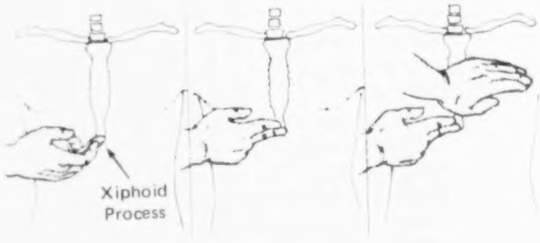
12. If the chest still fails to rise, remove hand from neck, grab lower jawbone (mandible) between the thumb and finger, lift jawbone upward, holding it in this position while you continue to perform mouth-to-mouth breathing.



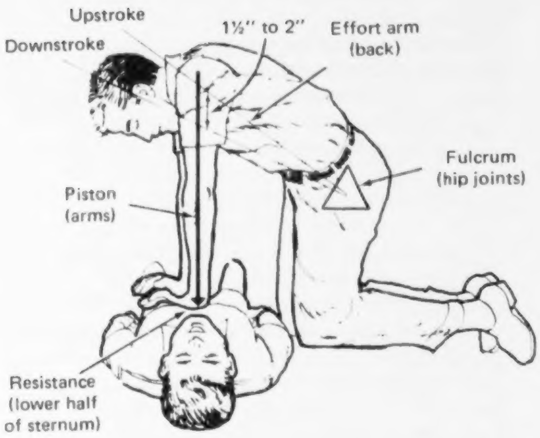
13. In children and infants, a lesser amount of air is necessary. In infants, the amount of air that can be held in your cheeks may be sufficient. The rescuer must cover both the mouth and nose of the infant or child with his mouth. Inflate the lungs once every three seconds (18-20 per minute). Forceful backward tilting of the infant's head may obstruct the breathing passages. Therefore, do not exaggerate the head tilt position.
14. Mouth- breathing may be carried out using much the same technique as for mouth-to-mouth, except, of course, the victim's mouth is held closed while your mouth is placed over the victim's nose.
15. If you are hesitant to place your mouth over the victim's, satisfactory mouth-to-mouth breathing may be carried out through a handkerchief.

External Heart Massage

1. After artificial respiration has been instituted with four quick breaths, and only then, check to see if external heart massage should be started.
   a. It is needed only if the heart has stopped.
   b. In many cases, the initiation of artificial respiration will be sufficient to cause resumption of the heartbeat.
2. Check for pulse.
   The best pulse to check is the carotid in the neck. This is a large artery lying close to the surface on either side of the air pipe. Practice feeling your own carotid pulse.
3. If there is no pulse, start external heart massage.
4. For external heart massage to be effective, the victim must be on a firm surface, i.e., ground, spineboard, or floor.
5. Locate notch at top of breastbone.
6. Locate the lower end of the breastbone. Great care must be exercised *not* to place your hand over the tip of the breastbone (xiphoid process).
7. Measure two fingerwidths up from the xiphoid process, and place the heel of one hand over lower one-third of breastbone, and the other hand on top of first.



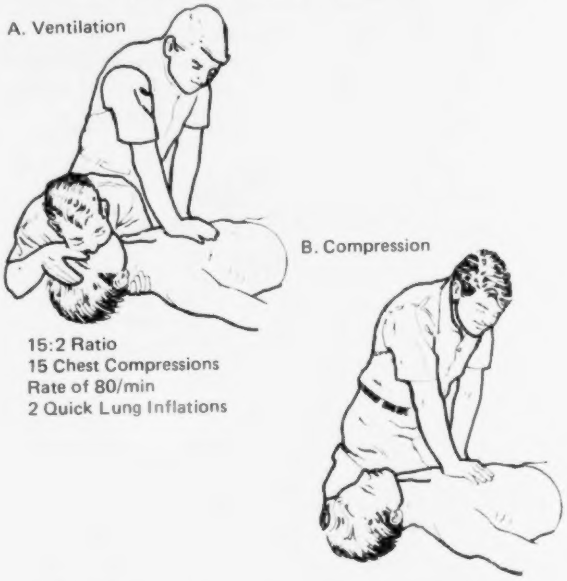
8. Bring shoulders directly over the victim's breastbone. Keep your arms straight and rock back and forth slightly from the hip joints exerting pressure vertically downward to depress the lower breastbone.



9. Then release pressure immediately. Compression and relaxation must be of equal duration. Do not remove the heel of your hand from the victim's chest when the pressure is released. Be sure that the pressure is completely released so that the breastbone returns to its normal resting position between compressions.
10. The breastbone should be compressed 1-1/2 to 2 inches for adults. For small children only the heel of one hand is used; for infants, only the tips of the middle and index finger are used to compress the sternum. In small children and infants, the heart lies higher in the chest and external compression should be applied over the mid-sternum.
11. This cycle is repeated 60-80 times per minute in adults, 80-100 in children, and *should be in a smooth, rhythmic fashion*.
12. Keep your fingers away from the victim's ribs to avoid fractures. Fingers may be interlocked during this procedure to assist in keeping them off the chest wall.
13. Check pulse frequently to see if the victim's heart has restarted.

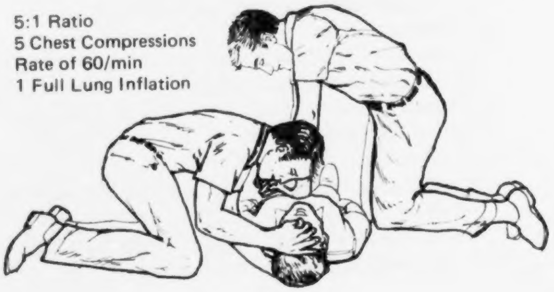
Techniques of C.P.R. For One and Two Rescuers

1. If only one rescuer is present, he must of necessity, administer both artificial respiration and external heart massage. This can be managed by interrupting external heart massage every 15 beats to give 2 deep lung inflations. Because of the interruptions for the lung inflation, the single rescuer must administer each series of 15 chest compressions at a more rapid rate, 80 compressions per minute, in order to achieve an actual compression rate of 60 compressions per minute. The two deep inflations must be administered in quick succession, within a period of 5 seconds. DO NOT allow full, long exhalation between breaths.



15:2 Ratio
15 Chest Compressions
Rate of 80/min
2 Quick Lung Inflations

2. If two rescuers are present, they should work as follows:
   a. One, positioned at the victim's head, administers artificial respiration and monitors pulse at carotid artery (neck) without interrupting artificial respiration.
   b. One positions himself on the *opposite side* of the victim's body at shoulder level and begins external heart massage.



5:1 Ratio
5 Chest Compressions
Rate of 60/min
1 Full Lung Inflation

Some Additional Factors in Cardiopulmonary Resuscitation

1. The victim's stomach may become distended with air. This is especially true in children and if the airway is not clear. It is not dangerous, but may interfere with lung inflation. It can be remedied by pressing on the stomach with the palm of your hand. This expels the air but may also lead to vomiting, so you must be ready to turn the victim's head to one side and clean out the mouth with your fingers or a cloth.
2. Cardiopulmonary resuscitation, once started, must be continued until spontaneous breathing and heartbeat occur or until the victim is turned over to a physician. In many cases, this will mean that the procedures must be continued while the victim is being transported to a medical facility. Under no circumstances should cardiopulmonary resuscitation be interrupted for more than a five (5) second period.

STOP THE BLEEDING

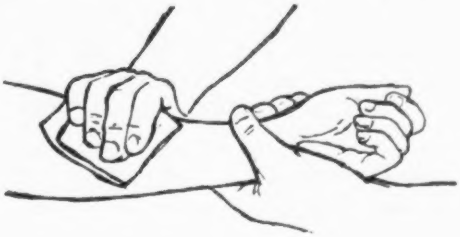
After checking the victim's airway, or having reestablished his breathing and/or heartbeat, the next most important step is to stop the bleeding.

Bleeding is the escape of blood from arteries, veins, or even capillaries because of a break in their walls. Control of severe bleeding is an urgent matter. Arterial bleeding from a major blood vessel can cause a casualty to bleed to death in a very short time.

Identification of the types of bleeding may be as follows:

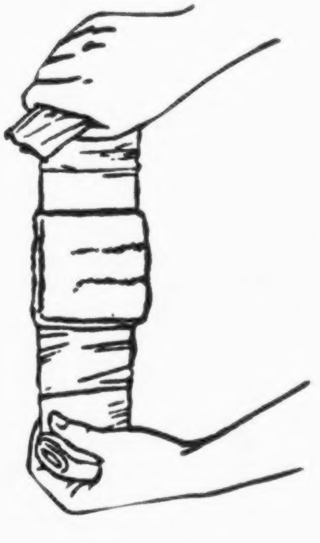
1. *Arterial bleeding:* Blood escaping is bright red, gushes forth in jets or spurts which are synchronized with the pulse.
2. *Venous bleeding:* Blood is dark red and escapes in a steady flow.
3. *Capillary bleeding:* Blood is intermediate in color, and oozes from the wound.

To control severe bleeding apply DIRECT PRESSURE over the entire area of the wound. Also, raise the affected part to a level higher than the heart, if there are no fractures, or if additional pain or harm will not be inflicted.

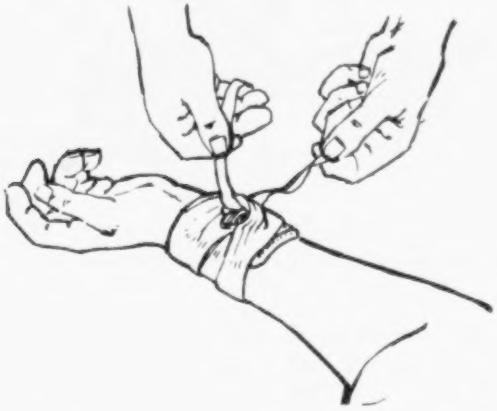


If immediately available, a thick pad of cloth should be held between your hand and the wound, or add the cloth as soon as possible.

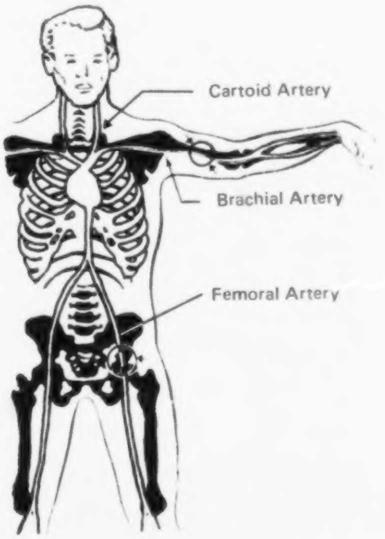
Preferably, the cloth should be sterile or clean. However, unclean material can be used. Do not remove this dressing if it becomes blood soaked. Rather, add more layers of cloth and continue direct pressure and elevation.



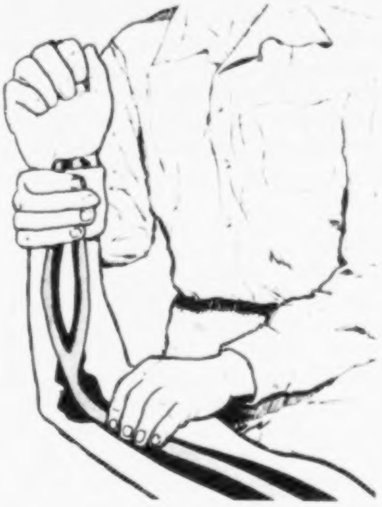
A pressure bandage can replace direct hand pressure on most parts of the body. Apply the pressure bandage by placing the center of the bandage or strip of cloth directly over the pad; hold the pad in place by circling the bandage ends around the body part and tie off with a square knot directly over the pad.



If direct pressure does not control the bleeding, apply pressure at the appropriate PRESSURE POINT *while maintaining pressure over the wound and elevation.* Pressure on the PRESSURE POINT will control arterial bleeding in the region supplied by that artery.



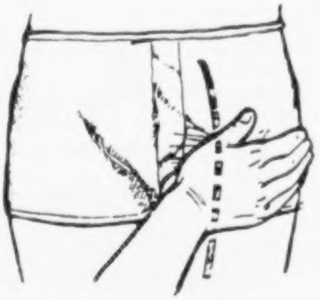
If the bleeding is from a wound in the lower arm, apply pressure to the *brachial artery.* This pressure point is located on the inside of the arm in the groove between the biceps and triceps, about midway between the armpit and the elbow.



Pressure should be applied by grasping the middle of the victim's upper arm, with the thumb on the outside of his arm and your fingers on the inside. Press or pull your fingers toward your thumb, using the flat inside surface of your finger, not your finger tips.

If the bleeding is from a wound in the leg, apply pressure to the *femoral artery.* This pressure point is located on the front center part of the diagonally slanted "hinge" of the leg, in the crease of the groin area, and over the pelvic bone.

Apply pressure by placing the heel of your hand directly over the spot described above. Lean forward with the arm straightened to apply pressure.



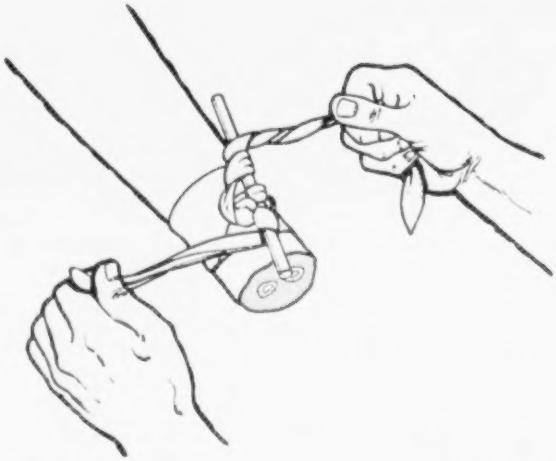
It is IMPORTANT when using the pressure points (brachial and femoral arteries) that you maintain pressure over the wound as well as elevation.

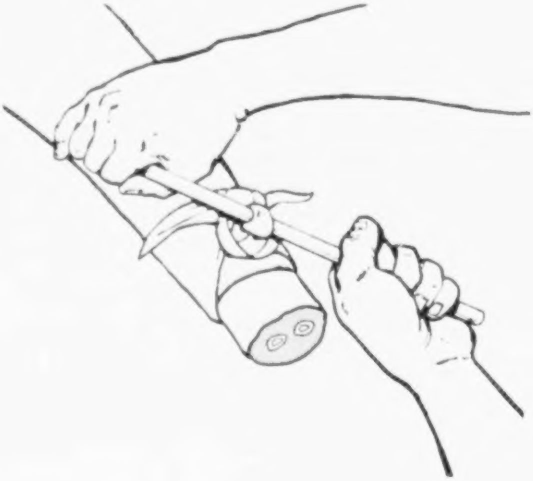
It is also important to remember, especially in situations involving mass casualties, that a conscious victim may apply pressure to his own wound to restrict or stop the bleeding allowing you to assist others.

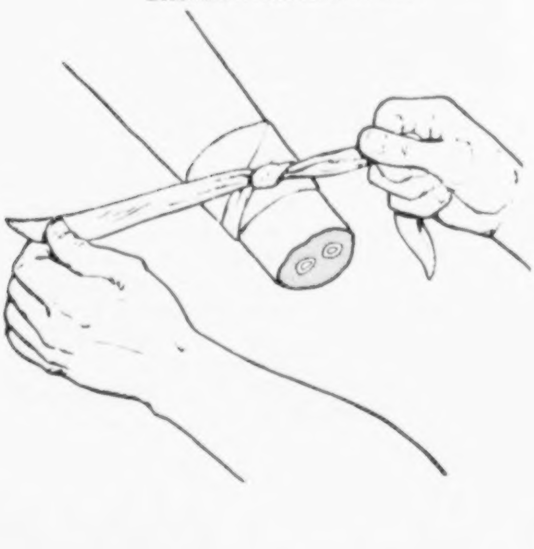
If the above methods do not control severe bleeding and the victim is in danger of bleeding to death, a tourniquet may be used as a last resort to save a life.

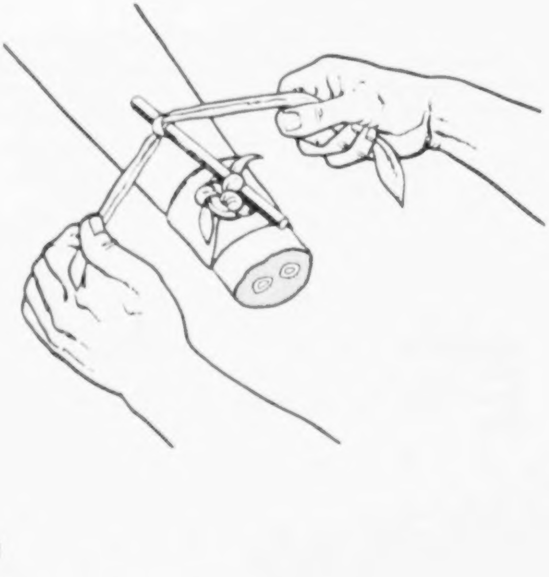
The TOURNIQUET should be used ONLY for the severe, life-threatening bleeding that cannot be controlled by other means. This method is used only on the arm or leg. To apply a tourniquet:

1. Place the tourniquet just above the wound edges. If the wound is in a joint area or just below, place the tourniquet directly above the joint.
2. Wrap the tourniquet band tightly twice around the limb and tie a half knot.
3. Place a short, strong stick, screwdriver or any similar object that you can find on the half knot and tie a full knot.
4. Twist the stick until bleeding stops.
5. Secure the stick in place.
6. Attach a note to the victim giving the location of the tourniquet and the time it was applied.
7. Once the serious decision to apply a tourniquet has been made it should not be loosened (except on the advice of a physician).
8. Treat for shock and get medical attention IMMEDIATELY.









The following quick reference chart gives first aid advice for burns according to classification:

FIRST AID		
BURN	**DO**	**DON'T**
First Degree (redness, mild swelling and pain)	Apply cold water and/or dry sterile dressing or additional commercial or home medication.	Apply butter, oleomargarine, etc.
Second Degree (deeper and blisters develop)	Immerse in cold water, blot dry with sterile cloth, and apply dry, sterile cloth for protection. Treat for shock. Obtain medical attention if severe.	Break blisters. Remove shreds of tissue. Use antiseptic preparation, ointment, spray, or home remedy on severe burn.
Third Degree (deeper destruction, skin layers destroyed)	Cover with sterile cloth to protect. Treat for shock. Watch for breathing difficulty. Obtain medical attention quickly.	Remove charred clothing that is stuck to burn. Apply ice. Use home medication.
Chemical Burn	Remove by flushing with large quantities of water for at least 5 minutes. After flushing eye apply sterile pad for protection. Obtain medical attention.	

PROTECT THE WOUNDS

When the airway has been checked or breathing/heartbeat reestablished and the bleeding has been stopped, the next step is to protect the wounds. Wounds may be classed as open flesh wounds, fractured bones and burns. Regardless of the class of wound, all must be protected from further aggravation or injury while transporting the victim to a hospital to help relieve his pain and discomfort. Burn wounds will be considered in detail at this point since they are most critical and are common in boating accidents.

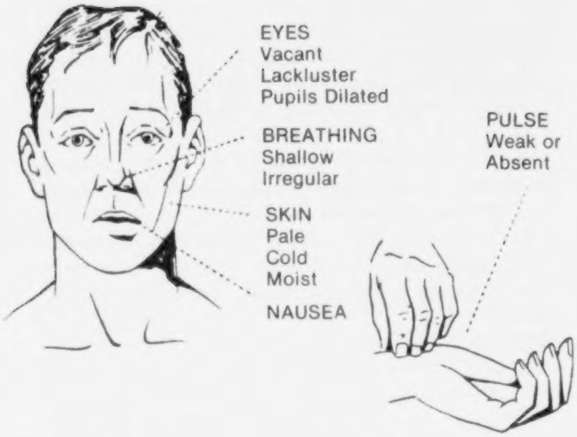
TREAT FOR SHOCK

Shock is a state of circulatory deficiency associated with depression of the vital processes of the body. It must be considered and followed for each victim, regardless of the nature or extent of his injuries. Always remember that a victim may go into shock hours after he is rescued and given first aid.

Injury related shock, commonly referred to as traumatic shock, is decidedly different from electric shock, insulin shock, and other special forms of shock. This section relates to traumatic shock which is a condition resulting in a depressed state of many vital body functions that could threaten life, even though the injuries would not otherwise be fatal.

Evaluation of the situation, according to the extent and severity of the injuries, is more important than any particular sign or symptom. The shock syndrome (set of symptoms which occur together) is variable and the symptoms listed below do not appear in every casualty, nor are they equally noticeable. The following findings are, however, representative of the varied picture which may be presented by the casualty in shock:

1. Eyes may be glassy, lackluster, pupils are dilated or suggest fear and apprehension.
2. Breathing may be normal, rapid, or labored.
3. The lips may be pale or cyanotic (bluish-gray).
4. The skin may be very pale or a peculiar ashen-gray (if dark complexion).
5. The skin temperature may be lowered and the body covered with a clammy sweat.
6. The pulse may be nearly normal or it may be rapid, weak, thready, and of poor volume.
7. There may be retching (trying to vomit; heave), nausea, vomiting, hiccups and dryness of the mouth, lips and tongue.
8. Restlessness, apprehension, are usual signs.



9. Veins in the skin are collapsed. Veins normally visible at the front of the elbow or forearm, and back of hands, may become invisible.
10. Frequent complaints of thirst. Shock victims may complain of thirst rather than pain, even when they are severely wounded. It's easy to recognize the fully developed picture of shock, but it is not so easy to recognize the victim about to go into shock.

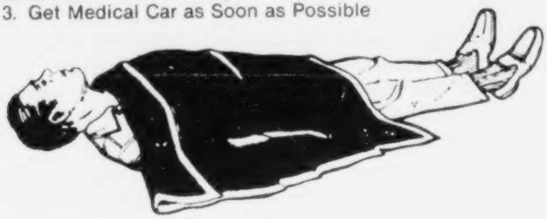
First aid for SHOCK should be given to any seriously injured person.

To prevent or give first aid for shock, the following steps should be taken: (1) Keep the victim lying down; (2) Maintain the victim's normal body temperature; and, (3) Get medical care as soon as possible.

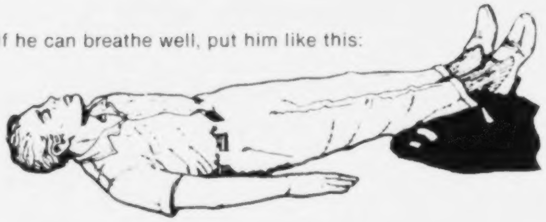
Depending on the injury, the victim's body should be positioned to minimize the danger of shock. The most desirable position is lying down with the feet raised 6 to 8 inches. If you are uncertain as to the type of injury, keep the victim flat on his back. The following chart gives variations in this position based on the injuries the victim has sustained:

Injury or Condition	*Position*
1. Back or neck	1. Do not move the victim
2. Wounds of face and jaw	2. Sitting and leaning forward
3. Unconscious	3. On side
4. Head injury	4. Flat or propped up (head never lower than body)
5. Breathing difficulty	5. Head and shoulders raised

1. Keep Victim Lying Down
2. Maintain Normal Body Temperature
3. Get Medical Car as Soon as Possible

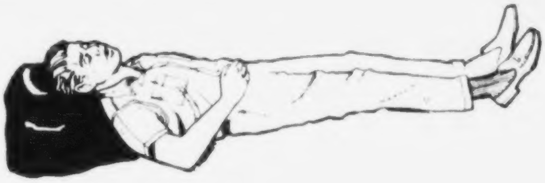


If he can breathe well, put him like this:

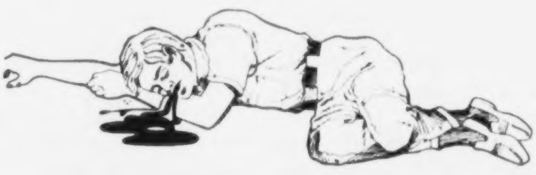


Maintain normal BODY TEMPERATURE (98.6 degress F.). If environmental conditions are cold or damp, protect the victim by placing blankets or additional clothing over and under the victim. If conditions are hot, provide protection from the heat or sun (shade) and do not add heat.

If he can not breathe, put him like this:



If he is bleeding from the mouth, put him on his side with knees bent and his head on his arm. Watch carefully to see that he keeps breathing.



Obtain MEDICAL CARE as soon as possible. If this care will be delayed for an hour or more, water, preferably containing salt and baking soda (1/2 level teaspoon of salt and 1/2 level teaspoon of baking soda to each quart of water) is recommended. An adult should be given about 4 ounces every 15 minutes, a child approximately 2 ounces, and an infant about one ounce. DO NOT give fluids if the victim is unconscious, having convulsions, vomitting, becoming nauseated, or if surgery is likely.

MISCELLANEOUS INJURIES AND ILLNESSES

Injuries and sudden illnesses other than those mentioned previously may occur. The following steps are first aid measures only. Medical advice and attention should be obtained as soon as possible.

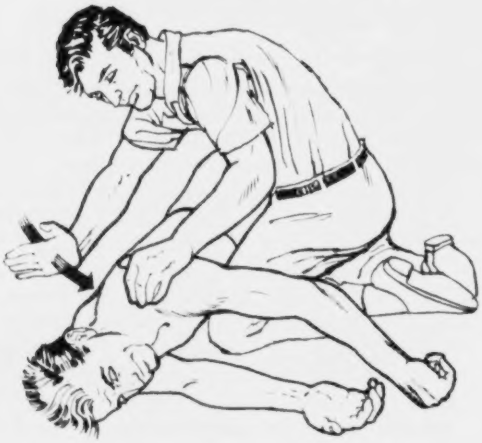
If a medical emergency occurs on the water and your boat is equipped with a two-way radio, do not hesitate to call the Coast Guard to obtain medical advice and possible evacuation.

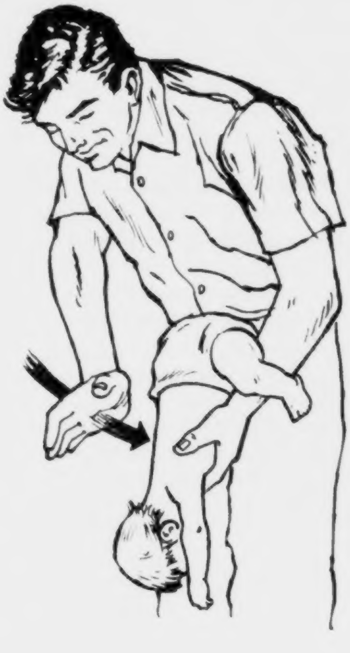
a. Choking Accidents or "Cafe Coronaries". Choking accidents are often called "Cafe Coronaries" because they happen so frequently in restaurants. Although choking casualties are often difficult to differentiate from heart attack victims, it is imperative to recognize the difference between them, because the emergency procedures may differ. You can often tell the difference simply by watching the victim.

b. Heart Attacks. Unless the heart attack is so massive as to cause almost instant death, the victim will likely clutch at his chest. He will perspire, make sounds of excruciating pain, perhaps even cry out. He will be short of breath, but able to breathe.

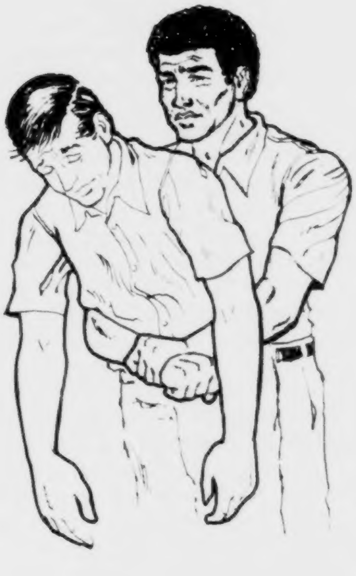
c. The Choking Victim. If the windpipe is blocked, and after the initial reflex of coughing, the victim will NOT be able to BREATHE or even GROAN. He may become very agitated. He then becomes cyanotic (blueness or grayness of the skin, fingernails, and mucous membranes) and slides into unconsciousness. It should be noted that some victims suffering from choking accidents leave the area fearful of causing a scene, and may collapse in the restroom, unattended. Someone should always follow the victim to ascertain his condition.

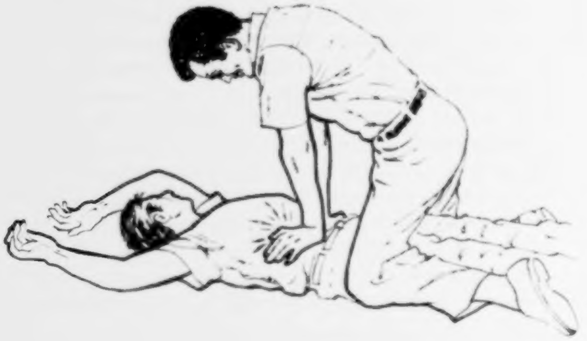
If the victim is coughing, or otherwise trying to eliminate the foreign matter, initially, it is best NOT to interfere with these efforts and NOT to strike him on the back. He should be encouraged to breathe slowly and deeply. DO NOT question him needlessly. Be calm and try to encourage him to cough. If these efforts of expulsion cease, and the victim becomes anoxic (oxygen deficient), semiconscious, or unconscious he should be rolled onto his side toward you. Deliver four firm blows with the heel of your hand over the victim's spine and between his shoulder blades.





d. *The Heimlich Technique.* The Heimlich Technique is a method of treating choking victims. This technique calls for the rescuer to stand behind the victim, put both arms around him, just above the beltline, allowing the victim's head, arms, and upper torso to hang forward. Grasping your own right wrist, quickly thrust upward into the victim's abdomen, forcing the diaphragm up. This compresses the lungs and expels the residual air in the lungs upward. The foreign object will often pop out of the victim's windpipe like a cork from a wine bottle. If the victim is lying face down on the floor, sit astride the victim's lower torso or buttocks and perform the hug the same as for a standing victim. If the victim is on his back, sit astride the pelvis, and place one hand on top of the other and forcefully thrust into the upper abdominal region. A second person, if available, should be ready to remove the foreign matter from the mouth. If the victim vomits, his mouth should be immediately cleaned out by turning his head to one side and cleaning out his mouth with your fingers or cloth.





HANDLING AND TRANSPORTATION OF THE INJURED

One of the major problems in dealing with injured persons aboard small boats is that of transporting the victim to medical help. In many situations, it would be difficult, if not impossible, for medical help to reach the victim; therefore, the boatman must have a basic knowledge of transportation of injured persons so that the victim may be safely and quickly delivered to medical help.

The sooner the victim can be moved, the better. It is normally the responsibility of the boatman giving first aid to see that the victim is transported safely and without being subjected to further injury, shock, or unnecessary pain.

Moving an injured person is precise work. It calls for close teamwork and great care. Even the act of placing the victim on a stretcher demands coordination and practice. The simple movements involved in lifting the stretcher-bound victim and walking with him call for specific procedures:

There are two important rules to remember when transporting an injured person. If possible, never move the victim until he has been examined and his injuries have been protected by properly applied splints and dressing. Always transport seriously injured victims in a lying down position.

9. Carbon Monoxide

Boaters should be aware of the danger from carbon monoxide (CO) coming from internal combustion engines. Carbon monoxide is a colorless and odorless gas which is often undetected until too late. It causes headaches, nausea, vertigo and death. People with cardiovascular disease are the most susceptible.

Carbon monoxide can build up in any enclosed compartment, usually from a leak in the exhaust system. But, it can also infiltrate a boat underway by the back draft caused by a square stern. Exhaust from a power generator can enter a boat through dry sink drains, especially on still days when at anchor. Gasoline powered inboard engines are potentially the most hazardous. When a boat is closed up tight with the engine running, the carburetor may pull the air out of the cabin, lowering the cabin air pressure. This in turn may draw carbon monoxide laden air into the cabin from outside.

Carbon monoxide can easily be purged from your boat if proper precautions are taken. When underway, run with an open hatch forward and an opening aft that will allow air to circulate through the boat from front to back. This will flush out carbon monoxide concentrations. You should also make sure that sink drains and other openings into the cabin are on opposite sides and as far away from any exhaust outlets as possible. When anchored or tied up when there is no wind, you may refrain from using the generator. Also, make sure your boat's ventilation system is unblocked and in good working order.

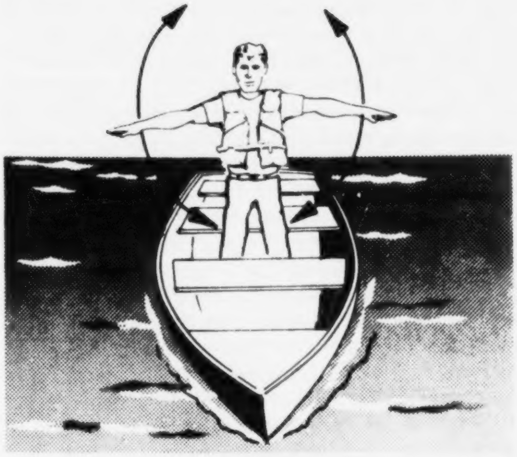
QUICK QUIZ: Hypothermia/First Aid/Carbon Monoxide

1. Drownproofing reduces survival time by nearly _________ in cold water.
2. About _____ of body heat is lost from the head.
3. The best place to check for pulse is the _____ artery.
4. To control severe bleeding apply ___________ over the entire area of the wound.
5. Carbon monoxide is hard to detect because it is a _____ and _____ gas.

E. Distress Signals

In general, any signal that will attract attention and bring help is, of course, OK. However, if your signal is a known or recognized distress signal, your chances of getting help are that much better.

A frequently recognized distress signal for small boats on U.S. waters is to slowly and repeatedly *raise and lower your arms, outstretched on each side* as shown in the sketch below.



All other visual signals require some sort of equipment.

VISUAL DISTRESS SIGNALS

The requirement to carry visual distress signals became effective on January 1, 1981. This regulation requires all boats which operate on the high seas, the Great Lakes, or territorial seas up to a point where the waters first become less than two miles wide to carry visual distress signals.

The only exceptions are during daytime (sunrise to sunset) for:

- Recreational boats less than 16 feet in length.
- Boats participating in organized events such as races, regattas or Marine Parades.
- Open sailboats not equipped with propulsion machinery and less than 26 feet in length.
- Manually propelled boats.

These boats must carry required night signals when used on these waters at night.

"PYROTECHNIC VISUAL DISTRESS SIGNALLING DEVICES" must be Coast Guard approved, in servicable condition and stowed to be readily accessible. The date of serviceable life must not be expired. Launchers which were produced prior to January 1, 1981 for use with approved signals need not be labelled as Coast Guard Approved.

USCG Approved Pyrotechnic Visual Distress Signals and Associated Devices include:

- Pyrotechnic red flares, hand held or aerial.
- Pyrotechnic orange smoke, hand held or floating.
- Launchers for aerial red meteors or parachute flares.

Red hand-held flares can be used by day, but are most effective at night or in restricted visibility such as fog or haze. Only hand-held flares made after October 1, 1980 will be approved by the Coast Guard for use on recreational boats. When selecting flares for your boat look for the Coast Guard Approval Number and date of manufacture. Make sure that the device does **not** carry the marking: "Not approved for use on recreational boats."

These things are not toys, so keep small children away from them and never use them unless you need help.

Projected devices such as pistol launched and hand-held parachute flares and meteors have many of the characteristics of a firearm and must be handled with the same caution and respect. In some states the pistol launcher for meteors and parachute flares may be considered a firearm. Therefore, check with your state authorities before obtaining such a device.

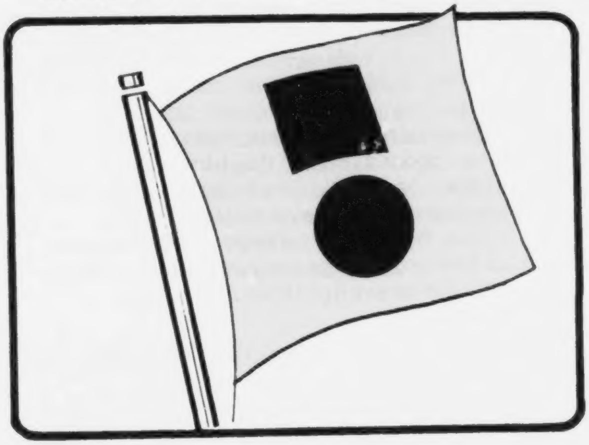
Also, hand-held pyrotechnics may expel ash and slag as they burn. Even though these particles cool quickly, they can cause painful burns or ignite materials on your boat. The flare itself could start a fire if dropped. These devices should be held over the side in such a way that hot slag will not drip on you or your boat.

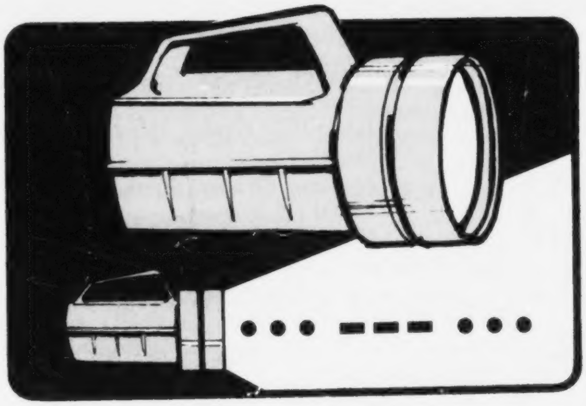
"NON-PYROTECHNIC VISUAL DISTRESS SIGNALLING DEVICES" must carry their manufacturer's certification that they meet Coast Guard requirements. They must be in servicable condition and be readily available for use.

This group includes:

- Orange/black distress flag.
- Electric distress light.

The distress flag must be at least 3 x 3 feet with a black square and ball on an orange background. It is accepted as a day signal only and is especially effective in bright sunlight. The flag is most distinctive when waved on something such as a paddle or boathook or flown from a mast.





The electric distress light is accepted for night use only and must automatically flash the international SOS distress signal (●●● — — — ●●●). Flashed four to six times each minute, this is an unmistakable distress signal, well known to most boaters. The device can be checked any time for serviceability if shielded from view. An ordinary flashlight is not acceptable since it must be manually flashed and does not normally produce enough candle power.

No single signaling device is ideal under all conditions and for all purposes. Consideration should be given to the various types, and the existing conditions of visibility at the time.

If pyrotechnic devices are selected, a minimum of three must be carried. Any combination can be carried as long as they add up to three signals for day use, and three signals for night use. Three combination day/night signalling devices meet both requirements.

The following is an illustration of the variety and combinations of devices which can be carried in order to meet the requirements:

1. Three hand-held red flares (day and night).
2. One electric distress light (night), one orange distress signal flag (day).
3. One hand-held red flare and two parachute flares (Day and night).
4. One hand-held orange smoke signal, two floating orange smoke signals and one electric distress light (day and night).

NUMBER MARKED ON DEVICE	DEVICE DESCRIPTION
	NIGHT USE ONLY
161.013	Electric Distress Light for Boats
	DAY USE ONLY
160.022	Floating Orange Smoke Distress Signal (5 minutes)
160.037	Hand-Held Orange Smoke Distress Signal
160.057	Floating Orange Smoke Distress Signal (15 minutes)
160.072	Orange Distress Signal Flag for Boats
	NIGHT AND DAY USE
160.021	Hand-Held Red Flare Distress Signal
160.024	Parachute Red Flare Distress Signal (37mm) (These signals require use in combination with a suitable launching device)
160.036	Hand-Held Rocket-Propelled Parachute Red Flare Distress Signal
160.066	Red Aerial Pyrotechnic Flare Distress Signal for Boats (These devices may be either meteor or parachute assisted type. Some of these signals may require use in combination with a suitable launching device.)

THE REGULATION STATES:

> "No person in a boat shall display a visual distress signal on water to which this subpart applies under any circumstances except a situation where assistance is needed because of immediate or potential danger to the persons aboard."

In addition to those signals which are specifically required and approved by the Coast Guard, there are a number of other signals that have been traditionally used which are also effective. These signals, however, cannot replace those prescribed by regulation. They are:

- signal mirror
- dye marker (daytime)
- arm waving
- gunshot at 1 minute intervals*
- fire in a bucket*

*be extremely careful when using these signaling methods!

Most search and rescue craft today carry radar; and there's also a gadget you can carry in your boat called a radar reflector.

It's a good idea for all small wood or fiberglass vessels to carry one of these, and preferably to have it mounted permanently. However, if this is impractical, most of them are collapsible and store easily. If you're in trouble, set up the reflector and your boat will show up on a radar screen quite plainly.

Continuously ringing a bell, or long blasts on your horn or whistle are also recognized distress signals. At night, or in low visibility, you can use your lights or your flashlight. The international signal on your light for distress is three short flashes, three long flashes, then three short flashes (SOS).

The radiotelephone is probably the best device for calling for help. The standard calling and distress frequencies, Channel 16 VHF-FM (151.6 mHz) and HF 2182 kHz, are guarded by all Coast Guard ships and search and rescue stations, as well as by most other ships and commercial vessels. Citizens band radio Channel 9 is now "monitored" but not "guarded" by Coast Guard stations and ships and cannot be considered an adequate substitute for a marine band radio. Radio equipment for this frequency is smaller and likely to be less expensive than that for the lower frequencies. To request life or death emergency assistance on the radiotelephone, use the code words "Mayday, Mayday, Mayday" followed by the emergency message.

QUICK QUIZ: Distress

1. To request life or death emergency assistance on the radio telephone, use the code words __________ .
2. All vessels must carry visual distress signals if operated during ______ .
3. An easily recognized distress signal that does not require equipment is: (write your answer in your own words)

____
____
____

F. Foul Weather Handling

Being caught out in bad weather in a small craft can be a frightening experience for the new boatman. This is why we say "Keep an eye on the weather." Some types of bad weather cannot be predicted with great accuracy—line squalls, thunderstorms, local fogs and the like. When wind and water start to build, it's time to head for shelter. It is also time to get everybody into a PFD. If there is heavy wave action, you might have to steer the boat so that the bow takes the waves slightly on one side or the other. Be careful to use only enough power to keep your boat heading into the waves—not letting it pound. A little pitching and tossing is a lot safer than rolling. If you have a boat with a relatively high freeboard at the stern it might be safe to lift the stern to the waves and head into shelter. If shelter is not off the bow or safe to proceed to, then you may have to stay where you are and *ride out the bad weather.* But that is still up to your judgment. Learn and know your boat's capabilities and limitations in rough water. Outboards with a low transom should never be run in a following sea (where the waves are coming towards the back of the boat) because the waves are often traveling at high speeds and can wash into the boat over the stern—swamping the boat and drowning the engine.

There are certain waters that are best to avoid if at all possible. Examples of these are: river mouths where river currents meet ocean currents or other river currents; areas immediately above and below dams; inlets and harbor entrances where the entrance is narrow and there is shallow water over shoals. In all of these there can be treacherous cross-currents and heavy, choppy water. These can get the unwary Skipper into trouble. A fundamental rule for all Skippers when it comes to "White Water" might well be—don't take chances.

QUICK QUIZ: Foul weather

1. The first thing to do if ever caught out in bad weather in your boat is to ____________ .
2. When heading into heavy waves it is generally best to steer the boat so that the waves hit the boat ____________ .

G. Water Activities

Fishing is a popular water sport. Other boaters should reduce their speed when passing fishing boats. Be careful to stay clear of fishing lines and nets. When you are fishing, never anchor your boat to an aid to navigation or within a shipping channel; they must remain open at all times. Be careful not to fall overboard or capsize, particularly when fishing in a small boat. Consider how much equipment you have and the number of fishermen aboard for the size of your boat. Never overload it!

Hunters should be mindful of the weather, especially in the fall hunting season. Hypothermia becomes a more serious hazard then. Dress appropriately and always carry the required amount of PFD's. Because of the recoil, always remain seated when shooting from a boat. This will both prevent you from falling overboard and will improve your aim.

Water skiing is another rapidly growing water sport. There are special rules which apply to it that will ensure the skiing is done safely. Remember that water skiing is a three person team effort; the boat driver, tow operator/observer and the skier all must know their responsibilities. Remember that the skier is considered a passenger of the vessel and a Coast Guard approved PFD must be available for him in the vessel, if he isn't wearing it. (Ski belts are not Coast Guard approved). The boat operator should navigate safely in a designated water skiing zone, and never go near shore, fishermen or swimming areas.

The boat should not make sharp turns. Keep the skier inside the boat's wake. The towline should be at least 75 feet long. Rule of thumb for safety's sake is to keep the skier at least twice the length of his tow line from any potential hazards at all times.

If the skier falls, circle back slowly. Avoid getting the towline wrapped around the propeller or stretched across the path of other boats. When recovering skiers from the water, turn the motor off first.

Showing off or "hotdogging" is dangerous both to the skier and any bystanders who might be in the area. Use the proper techniques of the sport.

Finally, be sure to obey all the standard Rules of the Road while engaged in water skiing or any other water sport.

QUICK QUIZ: Water Activities

1. There should always be at least _____ people on a boat to assist the water skier. One _______ and one _______

H. Basic Navigation and Chart Reading

On the water it's a good idea to know where you are and where you are going. A compass is a handy little device that will assist you in getting where you want to go. Basically, a compass has a fixed orientation-North to South. It also has a reference mark on the glass bubble, called a lubber's line. The numbers in degrees or letters (N, NW, W, etc.) on the "floating" compass card remain stationary, while the lubber's line actually turns with the boat. Being able to steer your boat by the compass is particularly useful if you are out of sight of land, disoriented or in reduced visibility.

Charts are very valuable to boaters because they provide detailed information about channel markings, locations of aids to navigation, water depth, underwater hazards, and the shorelines. A thorough discussion of navigation methods would go beyond the scope of this publication. As a simple guide, to find your approximate position, identify at least three landmarks or fixed navigational aids from your chart and compare them with what you are actually observing. Charts have compass roses printed on them. These are diagrams of compass directions marked in degrees, with True North pointing to the top of the chart for ships with gyro-compasses, and an inner circle with Magnetic North adjusted for that location, for boats with standard magnetic compasses. Check the direction on your chart from where you are, to where you want to go. You then steer the same direction in degrees on your boat compass as you plotted on the chart's compass rose, and you will get where you're going.

A more in-depth mention of aids to navigation is found in Part V.

I. Review

In PART III you learned what is considered negligent operation. Keep in mind that at no time does the Coast Guard want to spoil anyone's boating fun—we want you to live it up—but mostly we want you to live!!!

Hazardous areas were next and examples were described so that you can avoid them in the future. When operating your boat, remember to avoid areas immediately above and below dams, wherever you see the diver's flag, and areas marked for swimming. Anchoring was the next subject and you learned about making up "ground tackle" and the right way to set it out as well as the danger of anchoring by the stern. By far, one of the most important sections was next—emergency procedures. The steps to be carried out for man overboard, capsizing, fire aboard, lost, disabled, or aground, and how to recognize and deal with problems involving hypothermia, injuries, and carbon monoxide. We want to remind you again to be sure you know what to do and how to do it for each of these emergency situations. The best way is to practice with drills. We do it and we're professional—why not try it out. Finally, a short section on handling your boat in fog and rough water. It is not possible to cover all situations in this program and much remains for you to learn through experience.

By far the best way for you to learn *all* the things you should know about boating is to take one of the formal safe boating courses from the Coast Guard Auxiliary, U.S. Power Squadrons, or your State boating authorities. These courses are given by experienced boaters who can give you many valuable tips about operating your boat.

Review Exercise, Part III, Underway

The following problems are of the situational type where you are asked to apply what you have learned to solve a problem. In most cases, you will find, if you look closely small clues that might help in determining the right answer.

1. Having seen all the fun that Charlie and Zelda were having, Charlie Noble's friend Irving Plimsole bought a boat, motor, and trailer. Charlie was trying very hard to teach Irving the principles of boating safety, but from time to time found it a trying experience. The time came that Charlie and Irving decided to take both boats and families to the lake for a joint cruise. All went well until Irving started to back away from the fuel pier. With the engine in reverse Irving opened the throttle wide intending to show Charlie what a sharp boat operator he was. The stern swung around too fast and slammed into Charlie's boat. "Oops" said Irving, "don't worry Charlie, my insurance will pay for the repairs." "That's all very well", Charlie said (gritting his teeth), "but repairs will cost over $200 and there's something else you'll have to do."

What do you think Charlie has in mind? Jot down your answers and go on to the next question.

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2. Charlie and Irving planned to cruise up to the head of the lake and anchor at a spot where the fishing was good and the swimming was great. However, having been there before, Charlie wanted to make sure that Irving would be aware that there were areas to be avoided. "Irving" Charlie said, "A lot of people like to skin dive where we're going and the swimming area itself is forbidden to boats, so if you see any of these markers stay well clear." Charlie quickly drew sketches of the signs Irving was to stay away from.

Draw simple sketches of the markers Irving is to avoid then go on to the next problem.

3. After an uneventful but enjoyable cruise up the lake, Charlie and Irving arrived at the quiet little cove where they planned to anchor for the day. "I'll go in and anchor first then you anchor behind me," Charlie shouted to Irving. Charlie then got out his ground tackle (anchor, chain and line) from the bow cuddy. He carefully made up the anchor line in coils and placed it on the bow. Using small amounts of power he drifted up to the spot where he wanted the anchor to dig in. When the boat was dead in the water he lowered the anchor to the bottom in 20 feet of water. Noting that there was little breeze and no current, Charlie put the engine in slow reverse and paid out the anchor line to the proper scope.

How much line do you think Charlie used for the proper scope? Write your answer then go to the next question.

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4. With his boat securely anchored and the engine shut off, Charlie signaled to Irving to come up to anchor. Irving turned the controls over to his wife Porta and climbed up in the bow to get his anchor ready. Porta steered toward the stern of Charlie's boat where Irving intended to anchor. All at once she realized she was coming too fast so she put the engine in reverse and gave it the gas. The boat stopped as if it hit a brick wall—but Irving didn't—he kept on going—right over the bow and into the water.

What did Irving and Porta do wrong?

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5. Most of the rest of the day was uneventful with Irving giving serious thought to taking a boating safety course from the Coast Guard Auxiliary as Charlie had done. However, along about early afternoon, heavy black clouds were observed down the lake in the direction of the marina and heading right for them. Heavy rain and gusts of wind could be seen whipping the water into white caps. Irving and Porta wanted to head back to the marina and launching ramp. Charlie recognized that the storm was a thunder squall that although very dangerous would quickly blow over.

What do you think he did? Write down your answer.

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PART IV, RETURNING TO PORT

A. Mooring (Docking)

On the open water, a boat seems to respond like a car. It even has the "feel" of a car. Problem is, though, it isn't a car. It doesn't have brakes for one thing, and it gets its steering orders from the rear, not the front. The "road" it's on isn't solid like concrete, but is moving and changing with wind, tide, and current.

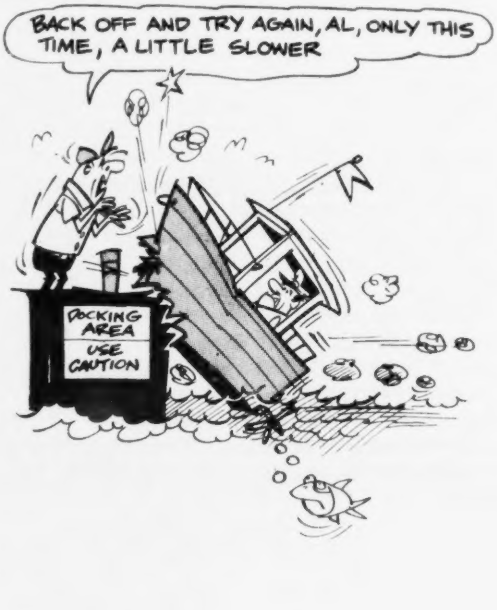
But, because a boat feels like a car on open water, our reflexes take over, and at first we drive a boat as we would a car. This can be extremely hazardous. The wake of the boat can upset other craft. The swinging stern can produce a surprise collision with moored objects such as buoys or other boats. Since the roadway is "alive" with tide, wind, and current, but our reflexes are treating it as a solid mass, we can quickly find ourselves totally out of control.

The waters near a dock should *always* be treated with the same respect and caution as a road you suspect might be slippery—where a sudden turn or change of speed could leave you out of control.

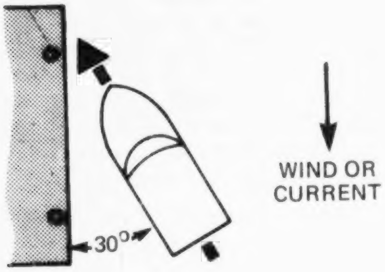
Every time you approach a docking area, you should use the same intelligence you'd use in testing a road for your car. Slow down. Try the rudder, speed up a bit—get the feel of the road and the response of the boat. *Re-educate* your senses and reflexes. Watch the stern when you make a turn. *See* where it swings. Now, and only now, are you ready to approach the dock. This is a good time to put out your fenders.

Approach the dock slowly, with alternating stop/slow-advance/stop/slow-advance actions. The water will be different a second from now—don't presume you have mastered it. If possible, approach the dock into the wind and current—unless, of course, you just intend to wave to friends in passing. Wind and current may not be in the same direction. Select the stronger force, and drive against it. This way, you have power and control.

Remember: A slow approach is seldom a bad approach!


BACK OFF AND TRY AGAIN, AL, ONLY THIS TIME, A LITTLE SLOWER
DOCKING AREA
USE CAUTION

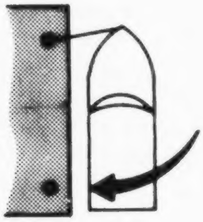
Thirty degrees is a good approach angle. It's about the angle you'd use to approach a curb with your car if you were parallel parking.



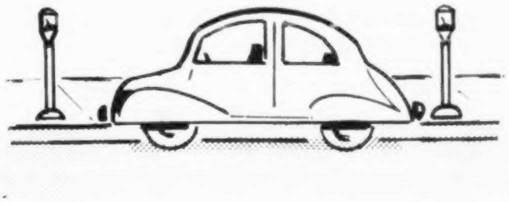
As the bow nears the dock, swing slowly parallel to it. Tie up the bow line first. If you tied up stern line first, the bow could be blown or carried by current into the open water near the dock, creating a hazard for other boats and possibly cause extensive damage to your own.

Tie up bow and stern. If you are in a tidal area, the lines should be at about a 45-degree angle to the boat—that'll leave enough line for the boat to safely rise or fall with the tide.

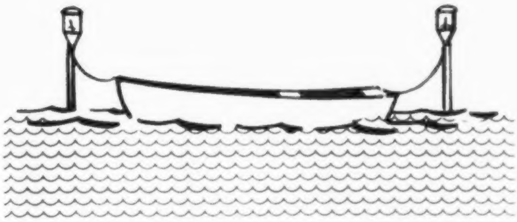
If, as you approach the mooring, the wind and/or current are moving toward the dock make your move parallel to the dock a bit further out and let the wind/current push you toward the dock.



Occasionally, you're going to have to approach a dock with the wind or current on your stern, or behind you. This is a difficult and sometimes dangerous maneuver. Depending on the speed of wind or current, you may have to put the motor in slow reverse as you approach the dock. Approach at a slight angle this time and gently swing parallel; but HAVE THE *STERN* line ready:—and tie *it* on first this time!



Docking is really something that takes practice, much as it took practice (and no substitute for it) to learn how to back a car into a parallel parking spot.



QUICK QUIZ: Docking

1. Approaching a dock, it is wise to stop the boat, then slowly advance, and alternate between the two, in order to ____________________ our senses.
2. Approaching a dock, if possible, have the wind, tide or current (whichever is the stronger) ahead/behind you (select the right one).
3. The basic rule for docking is like that for a car; always operate your vehicle so that you are in control. To stay in control through docking, attach the ________________ line first, when you've approached the dock against the wind/current, and the ________________ line first when you've approached it with the wind or current to your back.

4. Safe boating is a matter of common sense and courtesy, based on some simple, proven rules. No course on boating can answer all the problems that may occur, but it can and should provide a "sense" of conduct that can be projected to other situations. What if you were coming into a dock and made your approach "letter perfect," only to find someone else was either docking or leaving, totally ignoring your approach. Of course, he shouldn't, but there you are—and it'll happen. What do you think you should do, as a safe boater?

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B. Securing Equipment

There are two "secure" positions for equipment, and these are the only positions they should ever be stowed in. One is storage, the other "standby" or "ready." Before you get underway, all equipment should be in a ready position—PFDs out of storage and available—horn uncovered—working lines coiled and available—fire extinguishers handy.

As much as good docking is a matter of habit, it is equally as good a habit to secure all equipment before going ashore. That is the *only* way you'll know where it is the next time you go out.

We have provided you with a list of required, as well as, recommended equipment. It represents the minimum necessary for safe boating. But, "proof of purchase" is not a substitute for equipment lost or stolen. Make a place for it. A secure place.

The biggest and most expensive piece of "equipment" you have is your boat. To secure it you need good lines, but the best line is only as good as your worst knot.

QUICK QUIZ: Equipment

1. There are two "secure positions" for equipment ________________ and ________________.
2. Your boat is/isn't a piece of equipment.
3. The Coast Guard list of required equipment is the maximum/minimum required by law.

" I CAN'T AFFORD A TRAILER."

C. Cancel Float Plan

In previous lessons you learned the reasons for filing a Float Plan with a relative or neighbor. You also learned the very good reasons for cancelling the Float Plan when you return. Make both of these a boating habit. You can help conserve the Coast Guard's search and rescue resources for when they are truly needed. A wild goose chase could be very expensive when someone forgets to cancel his Float Plan. So, with the boat all snug in its slip, mooring, or back on the trailer at home—cancel the Float Plan!

WELL I THOUGHT YOU CANCELLED THE FLOAT PLAN.

Review Exercise Part IV Returning to Port

1. Charlie and Zelda Noble were returning to the dock and launching area after a perfect day of fishing and swimming. As they approached the dock, Charlie, instead of giving the maneuvers his full attention, was mentally adding to the length and weight of the fish he had caught. All at once Charlie woke up to the fact that he was nearing the dock at far too great a speed. In order to avoid crashing into the dock Charlie had to put the engine in full reverse which barely stopped the boat in time.

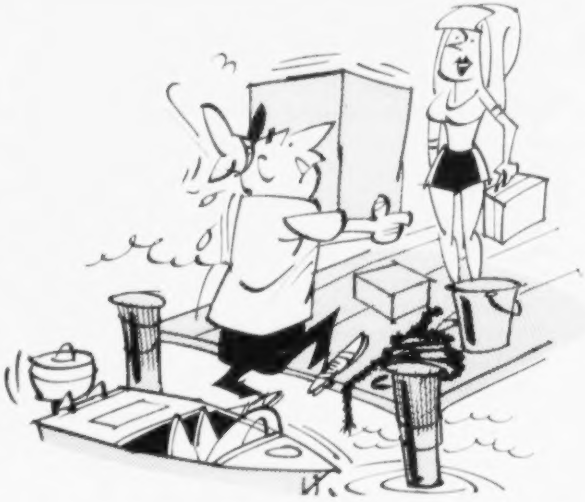
What *should* Charlie have done as he neared the dock? Write down your answer before going on.

2. Zelda, as befits a good Skipper's Mate, had gotten Charlie's new fenders out and rigged them properly over the side of the boat. She then got the mooring lines and made them up in loose coils ready to use. One for the bow mooring cleat and another for the stern. "Charlie," Zelda asked, "which line should I use first?" Charlie, noting the wind was blowing over the stern of the boat, pointed to one of the lines and said "that one."

Which line do you think Charlie pointed to?

3. In the sketch below Charlie and Zelda are unloading the boat before loading the boat back on the trailer. (Which is a good idea).

However, if you look closely you might see that Charlie is not as safe as he could be. What is he doing wrong?



4. Zelda went to the parking lot, got the car and trailer and slowly backed down to the water. She had become quite skillful at this through much practice, instruction, and several spirited discussions with Charlie. She carefully set the handbrake and parking gear and turned off the engine. She got out of the car and unreeled several feet of winch line. Charlie then eased the bow of the boat onto the back of the trailer, lined up the center line *and gave the engine the gun. Zelda then snapped the winch line hook to the bow.*

Do you think they did anything wrong? If so, what?

5. With the boat back on the trailer, Charlie drove off well clear of the ramp area and parked. While Zelda was loading the car Charlie climbed into the boat to open the drain plug, check the engine clamps for tightness, and checked all his safety gear for proper stowage. He then installed his holddown clamps and drew them up tight. It being nearly dusk, Charlie and Zelda operated all the car and trailer lights and found them to be OK. Giving the trailer safety chains one last check, Charlie then drove home. While Zelda unloaded the car, Charlie got out his garden hose and rinsed the boat thinking all the while of the fun he and Zelda had that day.

Do you think Charlie is through yet? Isn't there one more thing he should do?

PART V. OTHER HELPFUL TIPS

A. Preventative Maintenance

As the old saying goes "An ounce of prevention is worth a pound of cure." This certainly applies to your boat. Proper maintenance can keep your vessel running at maximum efficiency and extend it's operating life. Here is a quick checklist to run down periodically.

- Check for oxidation (rust is a type of oxidation) on all metal surfaces. Treat the affected spots with sandpaper and appropriate chemicals or paint. Wood hulls can be cleaned with soap and fresh water. Check for bad caulking. Fiberglass hulls can also be cleaned with soap and water. Be careful not to scratch the smooth outer gel coat. Scratches or small holes in the fiberglass can be repaired with special patching compounds obtained from a marine dealer. A clean hull will reduce friction drag through the water and save fuel.
- Fuel can also be conserved by properly tuning the engine. Check the oil and battery levels too, before you get underway.
- Inspect all mooring lines to ensure that they are not in a deteriorated condition. If you own a sailboat, periodically inspect the sails, rigging and lines. Keep your sails clean and make sure they are mended properly, since they take a lot of strain when in use. Also, dry out the sails completely before storing them, in order to prevent mildew.
- Always use the proper size engine and propellor for your type of boat.

B. Security

Not everyone in the world may be as honest and upstanding a citizen as you are. There are boat thieves out there as there are car thieves. When you leave your boat take the key and valuables with you. If your boat is parked on a trailer, take one trailer wheel off and lock it in your car trunk, or, add a hitch lock. A Hull Identification Number is required by law to be placed on all boats by the manufacturer. Write this number down in case your boat is stolen and you need to identify it. Also, write down the serial numbers of all your equipment, such as the marine radio, depth-finder, etc. Make sure your boat registration number or documented name and hailing port are clearly marked on the hull.

C. Storage

After you have finished enjoying your boat for the season, store it for the winter to ensure that the "fitting out" process next spring will be as easy as possible.

Canvas covers help keep the boat clean and protected from the elements. Let fresh air circulate through an opening in the boat cover to prevent mildew and wood rot.

When the boat is layed up for the season on a trailer, repack the wheel bearings with fresh grease to prevent rust from developing. If the boat is to be out for many months, it's a good idea to remove the tires and put the trailer up on blocks.

Keep the boat's fuel tanks full. This will prevent condensation which could cause corrosion to occur.

If you have a closed cooling system (inboard) keep the water jacket filled with antifreeze and the raw water lines flushed with fresh water and completely empty. An open system (outboard) should be flushed out the same way.

Remove boating equipment, such as PFD's, radios, first aid kits, depth finders, and store them in a cool dry place until next year's outfitting.

If your boat is berthed in the water year-round, make sure that the mooring lines are not chafing the boat and are in good condition. An old piece of garden hose put around the line as a guard is a good way to prevent rubbing damage. Watch for ice accumulation around the hull. Every week or so turn the engine and propellor shaft over to keep them in smooth-running condition.

QUICK QUIZ: Part V, Other Helpful Tips

1. A clean hull will reduce ________________ .
2. A ________________ is required by law to be placed on all boats by the manufacturer.
3. With a closed cooling system, the ________________ should be kept filled with antifreeze while in storage.

PART VI AIDS TO SAFE BOATING

A. Introduction

In this, the final part of this program we have a special problem. This problem simply stated is: there is no way we can know where you, the reader of this program, will be operating your boat. Areas for recreational boating in the United States include ocean waters, rivers, lakes and streams. These water areas have different requirements for Rules of the Road, required lights for boats, and even buoy marking systems. As you can see we are faced with two alternatives. First, we could ask you to learn *all* the area rules, lights and buoy systems. But then you would learn a number of things you might have little or no use for. Instead, in the following lessons you will learn the rules that apply to a majority of boaters. In turn, many of these rules can be applied with easily learned differences to the rules for other areas. There are several detailed treatments available on rules of the road for your area. Rules of the Road for International and Inland Waters are combined in Comdtinst M16672.2A. To obtain this book write to: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20462, and ask for the **NAVIGATION RULES: International-Inland**, stock number 050-012-00205-3. The (current) price is $6.00 per copy, but is subject to change.

NOTE: After January 1, 1983, the operator of each self-propelled vessel 12 meters or more in length is required to carry on board and maintain for ready reference a copy of the Inland Navigation Rules. The former Great Lakes and Western Rivers navigation rules are superceded and now included with the new Inland Rules.

Except for territorial seas, the Inland Rules apply to all U.S. waters. Generally, the International rules apply to waters on the high seas—but like all generalizations, there are exceptions. The exact boundary lines can be found in the NAVIGATION RULES book mentioned above.

While having two sets of rules can be frustrating, it is equally true that the differences represent just plain good sense where they exist. WHEREVER you are boating, you should find out which rules apply to you and your boat.

QUICK QUIZ: Rules

1. There are two different sets of Rules of the Road. They are detailed in
   ________________ .
2. The rules of the road used on the Mississippi River are the
   ________________ .
3. Generally, in all other water areas not covered by Inland rules the
   ________________ rules will apply.

B. Rules of the Road

In this lesson the situations, signals, and actions taken are based on the INLAND NAVIGATION RULES which most Skippers will use. First, some terms and definitions.

There is much similarity between the marine "Rules of the Road" and the rules we use in driving a car.

One important point to remember when you're on the water, is that the Rules of the Road were written with the intention of **preventing collisions**, not to give one vessel the right of way over another, and the responsibility for preventing collisions rests with **both** vessels. Whenever possible, maneuver or maintain your course and speed as required by the Rules, but if special circumstances arise that make this impossible, maneuver as necessary to avoid an accident.

In discussing Rules of the Road, we are going to use two special terms: "Stand on" and "Give way" boats. The "stand on" boat is the one required to maintain his course and speed. The "give way" vessel is the one which takes the required action to avoid a collision.

TUNNEL OF LOVE
ONE WAY

On shore, in an automobile, when we wish to pass or turn, we provide a hand signal, signal with a directional light, or give a toot on the horn. The purpose is to make certain the other drivers know what you are going to do—so that they won't take some other action that might cause an accident.

YOU'RE STILL CUTTING TOO DEEP, AL!

We do the same things on the water, but use either a whistle or horn to signal our intentions.

The length of the blasts, or toots is part of the signalling code. A prolonged blast lasts from 4 to 6 seconds.

A short blast is of about one-second duration.

We all know it does no good to have 20 car horns blowing in a traffic jam. So too, with the rules afloat. Use your whistle signals only when the situation requires them.

Further, when there is clearly no danger of collision, no signals are required—any more than on shore with a car.

Again rules of the road are just common sense. Action should be taken when it is *clear* that a potentially dangerous situation exists. The action should be CLEAR and DECISIVE and be taken early enough to be noticed and understood by the other boat.

Again, common sense applies—large vessels can't stop quickly, change course or generally maneuver as well as a small boat. Also, large vessels in harbors and rivers must stay with the channels. They have the right of way, and the burden to avoid collisions is on the Skipper of the smaller boat.

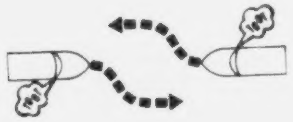
WE HAVE A SMALL BOAT SO WE NEED A BIG HORN

The danger signal for both Inland and International Rules is five or more short blasts. When you hear it, you must slow down and maneuver as necessary or stop until the danger condition—or confusion—has been resolved.

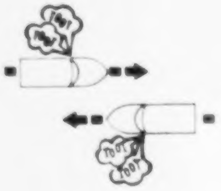
Sailboats, under sail, lack the means of control that may be required for decisive and timely action. Therefore, they have the right of way over a powered boat (but not over large vessels in confined or narrow channels or when overtaking another vessel).

There are three types of situations between two approaching vessels that require whistle signals to be given. These are: meeting, crossing, and overtaking.

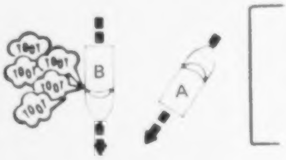
Meeting head-on or nearly so, just as in driving a car, you stay more to your right. One boat gives a single short blast; the other responds with the same signal. Now each Skipper knows what the other is going to do—and they've confirmed it.



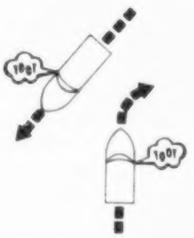
What about meeting but passing well clear of each other—the only time boats may pass with each other on their right (starboard-to-starboard)? Again, just common sense—to suddenly change course in order to pass the other boats left side would create a dangerous situation. Don't count on the other Skipper to know that; instead, give him two short blasts. He'll answer with two, and you'll both be relieved that you communicate so well.



If, at any time, there is confusion about signals or intent, five or more short blasts is the danger signal—each boat must come to a stop until the situation is clarified. This can happen when one boat gives an improper passing signal, and the other is confused. Or, as in the situation shown below, boat A is backing away from a dock and may not see boat B, who then sounds the danger signal.

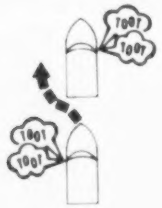


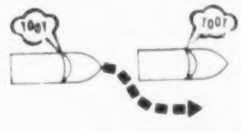
A crossing situation is similar to meeting another car at an intersection that has no stop signs. As ashore, the vehicle to the right is "stand on"—in fact, he *must* continue his course and speed. The give-way boat should slow down and/or change course to cross astern of the other boat. Either boat can initiate the sound signals by giving one short blast on the horn. The other, if in agreement, should reply with the same signal—one short blast. (In International rules, the sound signal is given only by the vessel maneuvering, and does not require a response).



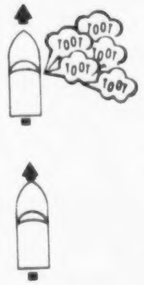
Finally, there are the overtaking situations. Normally, you'd pass the "stand on" vessel on his left, as you would in a car, and signal this intent with two short blasts. If it is safe to pass, the "stand on" vessel will respond with two short blasts. Then the "give way" boat passes, keeping well clear of the "stand on" boat.

If it is more reasonable to pass on the "stand on" boat's right, signal your intent with one short blast. A one short blast reply gives the go ahead.





Should the "stand on" vessel consider it unsafe for you to pass as you proposed, it must reply with five or more short blasts (the danger signal). The "give way" vessel must then remain in position and make no further attempt to pass until the "stand on" vessel answers a one or two short blast signal with one or two short blasts respectively.

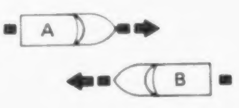


When a boat is ready to leave a dock, slip, or mooring—normally the boat is backed out into the regular traffic channel. Few boats maneuver well when going astern and you will be entering an area where there many be several other boats underway. The Inland Rules require that you sound one prolonged blast on the horn or whistle (4 to 6 seconds) as soon as you clear the dock or slip. A prolonged blast must also be sounded when approaching a blind bend in a river or channel. This signal would warn any boat approaching the bend from the other direction. Once in sight of each other, normal Rules of the Road and maneuvering signals apply.

QUICK QUIZ: Signals

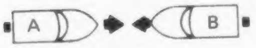
A sample of meeting, crossing, and overtaking problems are shown in the little sketches below. Inland rules apply to these situations.

1. Boats A and B are on courses as shown.



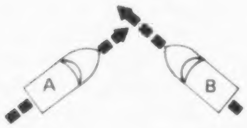
Boat A sounds ______ short blast(s).
Boat B replies with ______ short blast(s).

2. Here boats A and B are meeting head on. What signals do they exchange and what course changes do they make?



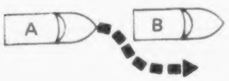
Boat A sounds ______ blast(s).
Boat B replies with ______ blast(s).

3. In this situation:
   a. Boat A is the ____________ vessel.
   b. Boat B is the ____________ vessel.

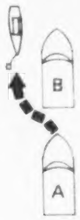


   c. What must boat A do (in your own words)? ____________
   d. What must boat B do? ____________

4. In this case boat A is overtaking boat B and wishes to pass boat B on B's *right*.
   a. Boat A is the ____________ boat.
   b. Boat B is the ____________ boat.
   c. Boat A sounds ______ short blast(s).
   d. Boat B replies with ______ short blast(s).



5. Shown below is another overtaking situation. Boat A wishes to pass boat B on B's left side. However, Boat B sees a potentially dangerous condition ahead that Boat A may not be able to see (another boat anchored ahead.)



   a. Boat A sounds ______ short blast(s).
   b. Boat B sounds ______ short blasts(s).
   c. What does boat A do now? (in your own words)

____
____
____
____
____
____

Restricted Visibility Signals

Whenever fog, rain, snow, smoke or any other phenomena reduces your ability to see (or be seen) sound signals should be used with both International and Inland Rules of the Road.

1. Power-driven boats underway and making way through the water shall sound one prolonged blast at no more than two minute intervals.

2. A power-driven boat underway but stopped and making no way shall sound at intervals of not more than two minutes two prolonged blasts in succession with an interval of about two seconds between them.

3. Sailboats should sound three blasts in succession; one prolonged then two short, at intervals of not more than two minutes.

4. A boat which is at anchor should, at intervals of not more than one minute, ring the bell rapidly for about five seconds. In addition, a boat at anchor may sound three blasts in succession: one short, one prolonged and one short.

NOTE: A boat less than 12 meters (39.37 ft) is not obliged to give these signals. If you choose not to, then give some effective sound signal of intervals not more than two minutes apart.

Bridge Approach Signals

You should also know what to do when requesting passage through a drawbridge. Sound signals are the primary means of alerting a drawtender if the weather conditions permit. In most cases you should sound a prolonged blast of 4-6 seconds followed by a one second short blast. Where there are two or more bridges in close proximity, each one may use a slightly different signal. These signals will be posted on signs near the bridge and usually on charts and other local navigational information sources. You can use a horn, whistle, megaphone or any method which will be heard.

Always wait for the drawtender to acknowledge your signal before proceeding through. If the bridge can be opened immediately, one prolonged blast and one short blast will be sounded in reply. If a delay is necessary, the bridge will sound five short blasts. Acknowledge this by giving the same sound signal in reply. As soon as the draw can be opened, the drawtender will sound the opening signal.

Radiotelephone communication can be used between your boat and the drawbridge in place of sound signals. If this is done, make sure that you are monitoring the bridge's radio frequency until your boat has cleared, in case there is an emergency change of instruction.

If your boat approaches a drawbridge already in the open position, sound the standard opening signal. If no response is given, proceed through the draw. Do not request a bridge to open for you if the only parts of your boat that won't pass under it are antennas or other equipment that can be easily removed or folded out of the way. Know the safe clearance height of your boat.

C. Navigation Lights and Shapes

Federal law requires that ALL boats display certain lights at night. These lights will tell others of your presence, what kind of a boat you are; that is, sailboat, motorboat, and even a rowboat, and how large you are. These lights seen on another boat will tell you whether you're meeting, crossing, or overtaking them.

Only four (4) colors are used: red, green, white, and amber, and the lights are "shaded" so they only show in certain directions. The Sidelights are red on the port (left) side, and green on the starboard (right) side and both show over an arc of 112 1/2 degrees from straight ahead to 22 1/2 degrees abaft of the beam on its respective side (see the diagrams below). To remember the colors, remember **port** wine is **red**.

The Sternlight is a white light placed on the stern (back) of the boat or as close to it as possible, and showing over the remaining 135 degrees, from where one sidelight leaves off (22 1/2 degrees abaft the beam) around the back of the boat to where the other sidelight picks up.

The Masthead light is a white light placed as close over the fore and aft centerline of the boat as practicable (it must be on the centerline for a boat over 12 meters). And it shows over 225 degrees, from straight ahead to 22 1/2 degrees abaft the beam on both sides of the boat, or covering the same arc as both sidelights combined.

The most common place you will see the amber (or yellow) light is as a Towing light and then it will show over the same arc as the sternlight. Some other lights show over a full 360 degrees and are called All-round lights. They can be any of the four colors mentioned above depending on the type of boat or what it's doing.

For most recreational boats (under 12 meters) the sidelights must be visible for one mile, and all other lights for two miles.

Vessels
Less than 20 meters

	Light	*Visible Range in Miles*		*Arc in Degrees*
		Less than 12 meters	*12 meters or more*	
⊃	Masthead Light	2	3	225
○	All-round light	2	2	360
◗ or ◣	Sidelights	1	2	112.5
⬯	Sternlight	2	2	135

The following describes the lights that boats must have installed if operating on any inland waters, or international waters.

Power Boats

Figure 1

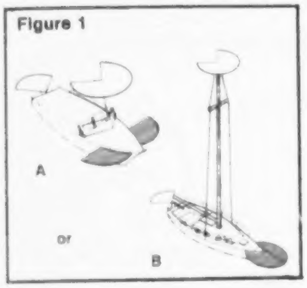
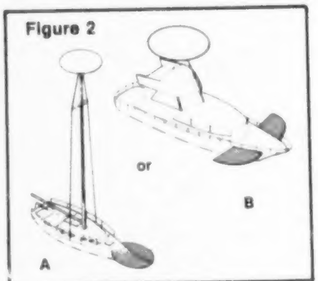


Figure 2



Note*** A sailboat running with a motor only, or under sail and a motor is considered a power boat.

1. If the boat is less than 12 meters (39.4 ft.) in length, it may show the lights in either Figure 1 or Figure 2.

2. On a boat less than 12 meters (39.4 ft.) in length, the masthead light must be 1 meter (3.3 ft.) higher than the sidelights.

3. A power boat less than 50 meters in length (does not have to but) may also carry a second masthead light abaft of and higher than the forward one.

4. A power boat less than 7 meters (23.0 ft.) in length and whose maximum speed cannot exceed 7 knots may, **in International waters only**, instead of the lights required above, show only an all-round white light but if it can, it should also show sidelights.

Sailboats and Boats Under Oars

Figure 3

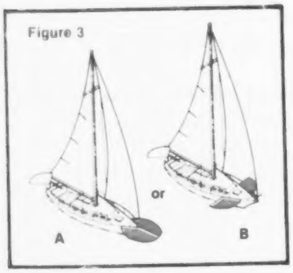


Figure 4

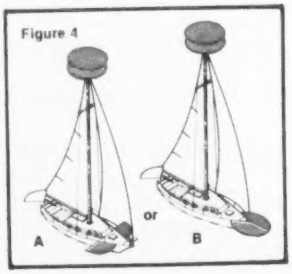


Figure 5

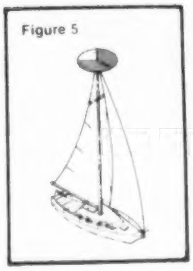
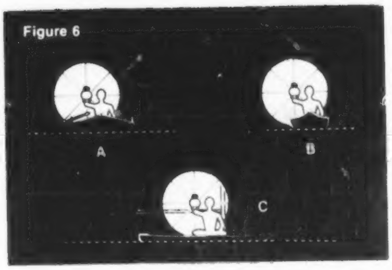


Figure 6



1. A sailboat less than 20 meters (65.6 ft.) in length should show the navigation lights shown in either Figure 3 or Figure 4. She may combine the lights in a single lantern carried at the top of the mast as shown in Figure 5.

2. A sailboat less than 7 meters (23.0 ft.) in length should if practical, show those lights described above, but if she does not, she shall have ready at hand an electric torch or lighted lantern showing a white light which must be displayed in sufficient time to prevent collision (see Figure 6).

3. A boat under oars may show those lights prescribed for sailboats, but if she does not, she shall have ready at hand an electric torch or lighted lantern showing a white light which shall be desplayed in time to prevent collision (see Figure 6).

Lights Used When Anchored

Powerboats and sailboats at anchor must display anchor lights. However, boats less than 7 meters in length are not required to display them unless anchored in or near a narrow channel, fairway or anchorage, or where other boats normally navigate.

An anchor light for a boat less than 20 meters in length is an all-round white light visible for 2 miles exhibited where it can best be seen. A boat less than 20 meters in Inland waters when at anchor in a special anchorage area is not required to exhibit an anchor light.

Day Shapes
REQUIRED ON BOATS BETWEEN SUNRISE AND SUNSET

Figure 7

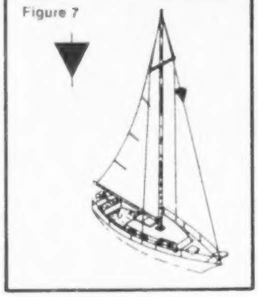
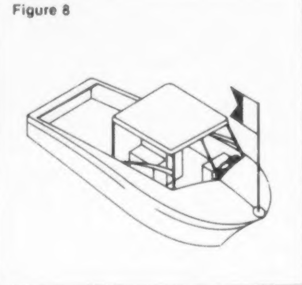


Figure 8



A boat proceeding under sail **and** a motor shall exhibit forward, where it can best be seen, a conical shape, apex downwards (See Figure 7), except that for Inland Rules, a boat less than 12 meters in length doesn't have to show the day shape.

Diving Operations

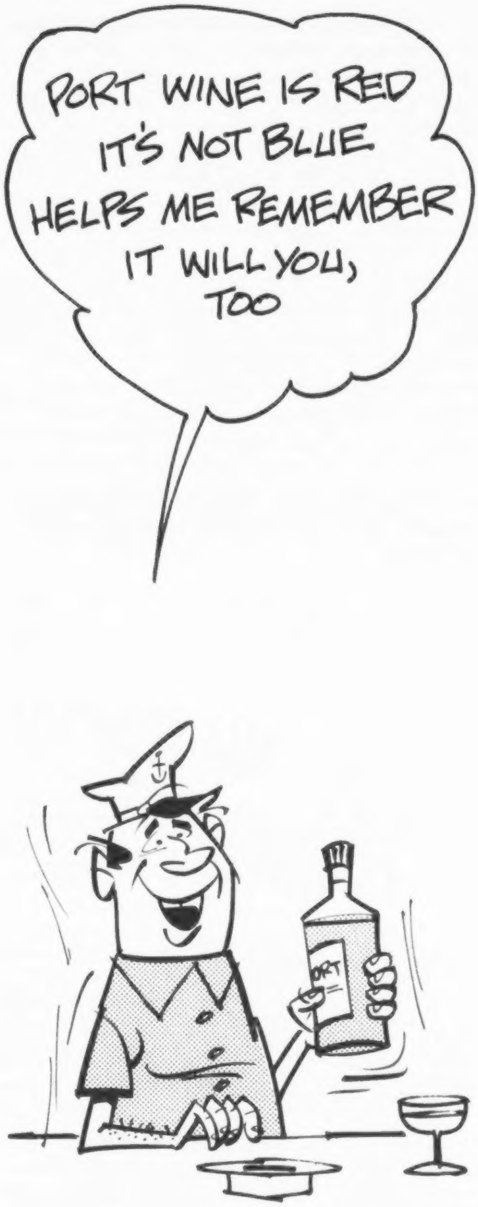
The Navigational Rules require boats which are restricted in their ability to maneuver due to diving operations or activity to exhibit a rigid replica of the international code flag "A" not less than one meter in height (See Figure 8).

This requirement does not have any impact on the use of the red and white diver's' flag which may be required by State or local law, or used by choice to mark the diver's location under water. The "A" flag is a navigation signal advertising only the boat's restricted maneuverability. It does not pertain to the diver.

In summary then, when you learn and remember the lights required, you will be able to:

be sure that *your* boat has proper lights; distinguish between a motorboat, or sailboat;

determine if you are in a meeting, crossing or overtaking situation, and you can get a good idea of how big the other boat is.



QUICK QUIZ: Lights and Shapes

1. Navigation lights installed on a boat tell you:
   a. The size of a boat.
   b. How fast a boat is going.
   c. Whether you are meeting, crossing, or overtaking another boat.
   d. All of the above.

2. The only colors used for navigation lights are: (In any order)
   a. ______________________
   b. ______________________
   c. ______________________
   d. ______________________

3. Only four different arcs of visibility are used for navigation lights. They are:
   a. ______________________
   b. ______________________
   c. ______________________
   d. ______________________

Try to answer these questions without referring to the sketches. Inland rules apply.

4. You are following *directly* behind another boat at night heading back to port. What color and what lights would you expect to see?

____

____

____

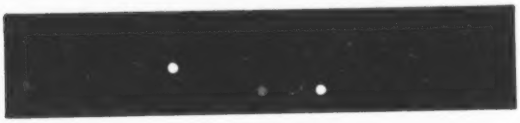
____

5. You and another motorboat are meeting directly head to head. The other boat is 26 feet in length. What color and what lights would you expect to see? Remember, *you* are looking at him.

____

____

6. While proceeding out for some late night fishing you observe these lights off your *port* bow as shown:

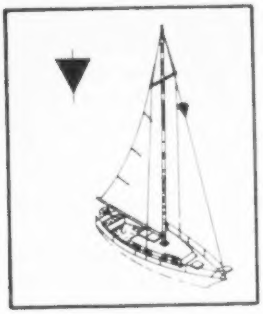


a. Are you in a meeting, crossing or overtaking situation?
b. Are you the "give way" or "stand on" boat?

____

____

7. You see this shape hanging from the rigging of a sailboat with its sails set:



What does it mean?

____

____

8. While proceeding at night in your boat you observe the lights shown below off your starboard bow:

a. Meeting, crossing, or overtaking?
b. Is he the "give way" or "stand on" boat?

D. Aids to Navigation

1. Introduction

In this, the final lesson, we have the same sort of problem that we had for Rules of the Road and required lights for boats. There are several buoy marking systems. What buoys you will see and what they mean will often depend on where you operate your boat. As before, there is no way we can know where you, the reader, will be operating your boat. In this lesson we will concentrate on the two buoy systems that are most common. These are the LATERAL (on which other systems are based) and the UNIFORM STATE WATERWAY MARKING SYSTEM.

Aids to navigation take the place on the water of street signs and road maps used on land. Aids to navigation are placed at various points along the coasts, rivers, lakes, channels, harbors, etc., as markers and guides to help you locate your position with respect to the shore and to hidden dangers.

All aids to navigation are protected by law. It is not only a VIOLATION OF COMMON SENSE, BUT A CRIMINAL OFFENSE, to cause any damage or hindrance to the proper operation of any aid. DO NOT deface, alter, move or destroy any aid to navigation. Never tie your boat to a buoy, daybeacon or light structure. AVOID anchoring so close to a buoy that you obstruct the aid from the sight of another boat. If you should unintentionally or unavoidably COLLIDE with or DAMAGE an aid to navigation, this must be reported to the Coast Guard.

There are differences in traffic laws between states; there are also differences in systems for operating on different bodies of water. The next few pages will talk about these different systems known as the LATERAL System of Aids to Navigation and the UNIFORM STATE Waterways Marking System (USWMS).

In 1983 the Coast Guard began making modifications to U.S. aids to navigation in support of an international agreement, signed by representatives from most of the maritime nations of the world. The primary purpose of the modifications is to improve safety by making buoyage systems around the world more alike and less confusing to the international mariner.

Port hand buoys and daymarks are being changed from black to green; and white lights on port and starboard hand aids are being changed to red and green respectively. Shapes and markings are being standardized. These modifications will be made over a 6 year period concluding in 1989, and will be accomplished during routine maintenance.

IT MAKES A GOOD ANCHOR WHILE I'M FISHING

QUICK QUIZ: Aids

1. Water borne street signs (buoys, daybeacons, ranges, daymarks, lights, etc.) are the same all over the United States.

☐a. True

☐b. False

2. The term "aid to navigation" as used in this program includes:

☐a. Conspicuous shapes and objects on shore, such as mountain tops, smoke stacks, radio antenna, etc.

☐b. Objects that have been primarily placed in location to assist in navigation.

☐c. Charts, instruments, devices, methods, etc.

3. Our different buoy systems are based on the __________ system.

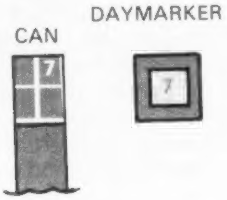
4. All "aids to navigation" are protected by __________________ .

IS IT RED, WHITE OR GREEN ???
I DON'T KNOW. IM COLOR-BLIND

2. The Lateral System

You can find your way around on the water using buoys and the appropriate charts. The *shape* of a buoy, its color, the *number* painted on it, and, when it is lighted, the *light* characteristics all will tell you what to do when piloting your boat.

This buoy is called a CAN buoy because of its cylinder-like shape.

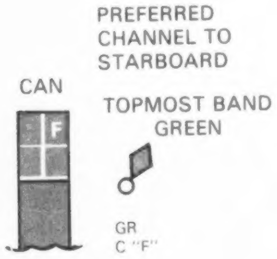

CAN
DAYMARKER
7
7

Most can buoys should be green by the late 1980's.

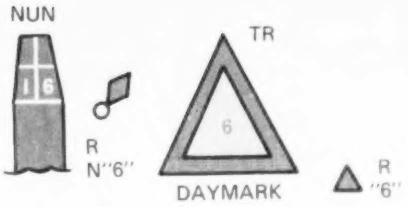
This type of buoy is normally found marking the left side of a channel (as you returned from seaward) and often is used to mark obstructions.

The number is always odd, that is 3, 5, 7, 9, and so on.

From time to time you may see a can buoy painted in red and green (or red and black) bands like this:

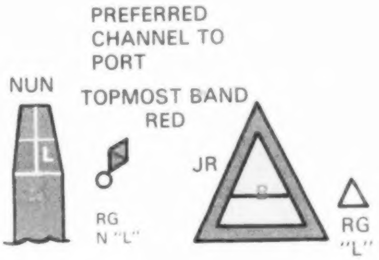

PREFERRED
CHANNEL TO
STARBOARD
CAN
TOPMOST BAND
GREEN
F
GR
C "F"

It won't have a number on it, but it may be lettered, however. This buoy will mark the junction of two channels. The top color will identify which side of the buoy you should pass on. Green on top-go to starboard, red on top-go to port.

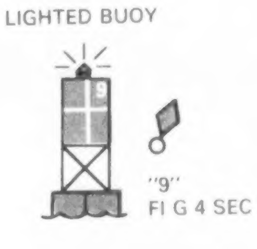

NUN
16
R
N"6"
TR
6
DAYMARK
R
"6"

This buoy is called a NUN buoy, again because of its shape. Most of these buoys will be painted solid red and have *white* even numbers on them—2, 4, 6, etc. Nun buoys mark the right side of a channel, as you return from seaward.

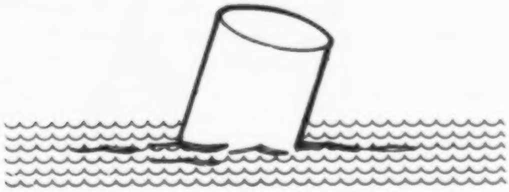
Other NUN buoys may be painted with horizontal red and green (or red and black) bands. Like banded can buoys, these buoys also mark channel junctions. Like this:


PREFERRED
CHANNEL TO
PORT
NUN
TOPMOST BAND
RED
L
JR
RG
N "L"
RG
"L"

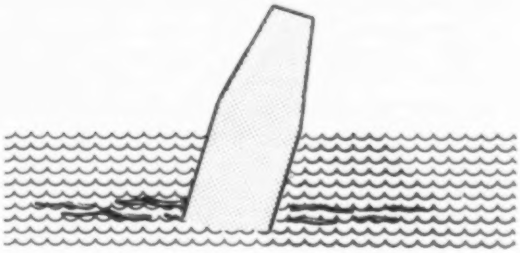
The buoy shown here is a LIGHTED buoy. It may have any of the specified colorings, which define its meaning. It has a light (and sometimes a radar reflector, bell, gong, or whistle) so it may be more easily located in times of low visibility. It may be numbered or lettered depending on its use.


LIGHTED BUOY
9
"9"
Fl G 4 SEC

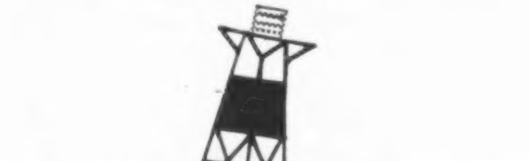
QUICK QUIZ: Introduction to Buoys



1. This buoy is called
   a. a ________ buoy.
   b. Most of the time its color will be
   ________ .
   c. If a number is on it, it will be (odd-even).
   (choose one) ________ .



2. This buoy is called
   a. a ______ buoy.
   b. Most of the time its color will be
   ____
   c. If a number is on it, it will be (odd-even).
   (choose one) ________



3. This buoy is called
   a. a ______ buoy.
   b. The color(s) will be ________ .
   c. It is identified with ________ .

4. In periods of low visibility *some* buoys can be located by their lights or
   ________.

Summary

As you've learned, buoys are, in effect, floating signposts for the boaters. By their color, shape, number, light, or sound they tell you how to avoid hazards and aid you in following a safe course. It is best to compare a chart of the area with these aids to see their full meaning.

Safe channels or perhaps a water hazard will be marked by buoys. How you pass these buoys or how you follow them to another point is the next thing to learn. A buoy is placed and its identifying characteristics are chosen to mark the safe channel as if entering from "seaward." A lot of Skippers remember this rule by memorizing the three R's or *Red Right Returning*. Like this:

And, of course, when leaving port and going out to sea you do the opposite. "Well," you might ask, "what do I do if I'm not entering from seaward?" For boatmen on rivers, going *upstream* against the current is the same as entering from seaward. On lakes when going from the outlet of the lake to its upper end is the same as entering from seaward.

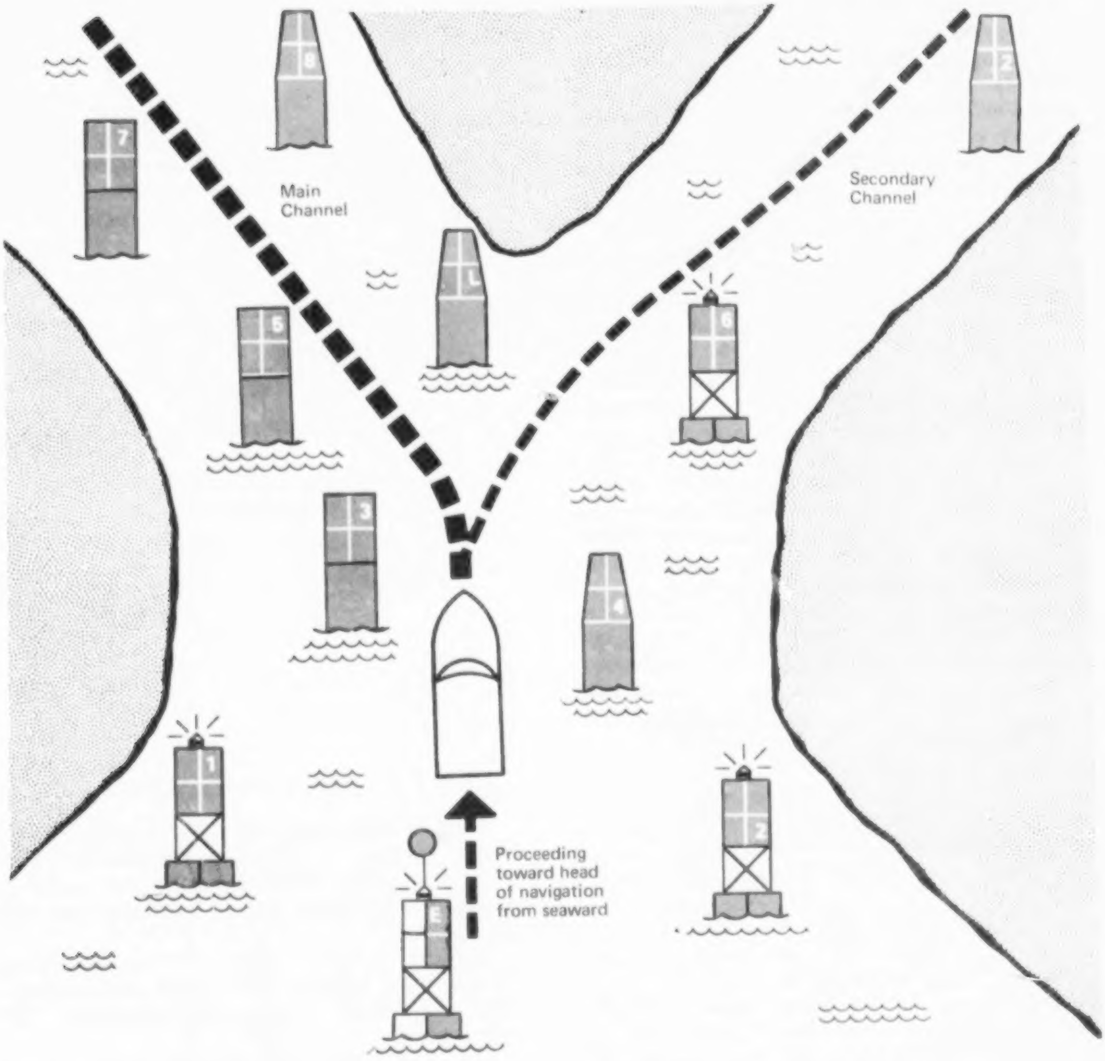
A word of caution: Don't regard buoys as immovable objects. They may be missing, drifting, or off their proper position because of storms, tides, and collisions.

NEW YORK
BOSTON

QUICK QUIZ: Lateral System

In the lateral system of buoys, proceeding in from seaward:

1. Green buoys (formerly black) mark the __________ side of a channel.
2. Red buoys mark the __________ side of a channel.
3. Lighted buoys help you find your way at __________ .
4. Red-and-green horizontally banded buoys mark __________ in a channel.


8
7
Main Channel
Secondary Channel
2
L
5
6
3
4
1
2
E
Proceeding toward head of navigation from seaward

Uniform State Waterway Marking System (USWMS)

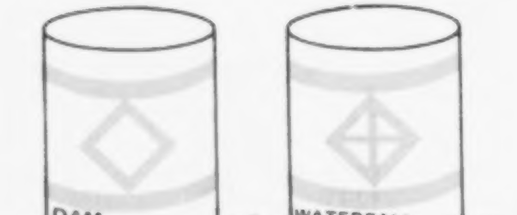
If you're the kind of Skipper who trailers his boat and rambles around over the highways to various lakes and streams, then this system will be of major interest to you. A lot of water areas used by boaters are located within the boundaries of a state. Since the concept of "proceeding from seaward" or "upstream" cannot be applied, the lateral system cannot be used. The Uniform State Waterway Marking System was devised for this reason and is now used by most states.

First, in the USWMS, buoy *shapes* have no meaning! Second, USWMS buoys come in two categories: A system of REGULATORY markers that tell you of dangerous or controlled areas, and AIDS TO NAVIGATION to mark safe channels. These are black and red and are generally used in pairs as in the lateral system.

Regulatory Markers

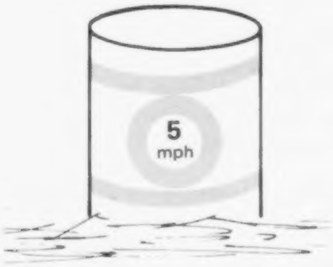
Regulatory buoys are colored white with international orange horizontal bands completely around the buoy. One band is at the top of the buoy with a second band just above the waterline so that both orange bands are clearly visible.

Different shapes are placed on the white portion of the buoy body and are colored international orange. Shown below are buoys with diamond shapes which always mean "BEWARE."

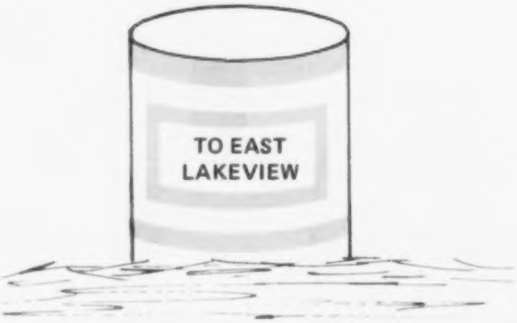


Note the words which are painted on the buoy which describe the hazard to be avoided. This is another advantage for boaters in the USWMS in that charts are not needed.

In this example a circle is used for the symbol and indicates a control. These can be placed on signboards ashore.



Finally, a square outlined in bright orange gives some form of piloting information. Like this:

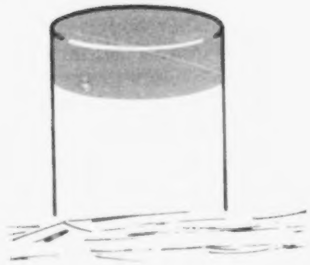


Aids to Navigation

Aids to navigation used in the USWMS are normally black or red and are used to mark channel limits. Generally they are used in pairs and the safe path is between the two buoys.

Special colored buoys are used where there is no marked channel or where there are scattered underwater dangers. For example:

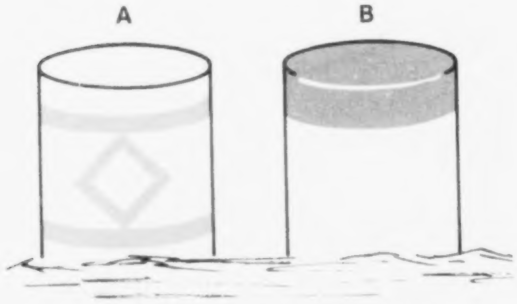
A white buoy with red top means that a boat must pass to the south or west of the buoy.



A white buoy with a *black* top means the safe water is to the *north* and *east* of the buoy. Finally, a buoy with vertical red and white stripes marks a danger area between it and shore.

QUICK QUIZ: USWMS

1. Shown below are examples of the types of buoys used in the USWMS system.

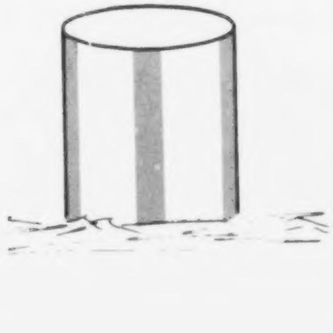


Buoy ________ is an aid to navigation.
Buoy ________ is a regulatory buoy.

2. The shapes of markers used in the USWMS system have no meaning.

☐ a. True
☐ b. False

3. When you see this buoy from your boat:



☐ a. Pass between it and the shore.
☐ b. Pass outside it and the shore.
☐ c. Pass on the south or west side.
☐ d. Pass on the north or east side.

4. Navigation buoys in the USWMS system are generally placed in ________.
5. White buoys with orange bands and diamond markers mean ________.
6. White buoys or signs with orange bands and circles mean ________.
7. White buoys or signs with orange bands and squares mean ________.

E. Review and Exercise, Part VI — Aids to Safe Boating

In this, the final part of your "Skipper's Course" you learned many of the things that will aid you, when operating your boat, to enjoy your cruise and return safely to port. In each of the three main topics, Rules of the Road, navigation lights, and buoy systems, we had the same problem. To cover every possible rule, light, and buoy is far outside the scope of this program. In each case we chose the rules that would apply to the most readers. Remember, if you desire a more complete coverage of these topics refer to appendix 4 for the Coast Guard office nearest you. The Coast Guard Auxiliary, Power Squadrons, and State Boating agencies are available for additional information and instruction.

In Section B, meeting, crossing and overtaking situations were discussed using Inland Rules of the Road, Inland Rules of the Road are very similar to International Rules. In this section you learned the proper signals and actions to be taken for the three most common situations: meeting, crossing, and overtaking.

In Section C, the required lights for boats were covered. In this section you taught yourself that the approximate size of a pleasure boat could be determined by its lights. In addition, you learned that you could tell when you were in a meeting, crossing or overtaking situation from the arrangement and appearance of the lights on another boat.

In Section D, you learned to identify the meaning of different buoys in the Lateral System and Uniform State Waterway Marking System. You also learned the concept of "entering from seaward" so that you would know on which side of your boat to pass a buoy. Just remember "red right returning."

Exercise: **Part VI, Aids to Navigation**

In the following situational type problems, you can apply what you have learned about aids to safe boating operation. The problems may involve Rules of the Road, navigation lights, and buoy systems. In all problems, apply the *Inland* Rules of the Road, and *Inland* navigation light requirements.

1. You and your family are on vacation at Florida's Biscayne Bay. You have rented a 32-foot cabin cruiser which is fully equipped to operate on inland waters. Late in the afternoon a small, but fighting mad Marlin is hooked by the wife and pulled into the boat after a long battle. Heading back to the Snug Harbor Marina you put on your navigation lights and check them. Try to fill in the following blanks without referring to the text. You expect to see the following lights:

a. on the stern a ______ (color) ______ degree light, visible for ______ miles.
b. on the right side a ______ (color) ______ degree light, visible for ______ mile(s).
c. on the left side a ______ (color) ______ degree light, visible for ______ mile(s).
d. on the mast or cabin top, a ______ (color) ______ degree light, visible for ______ miles.

BERMUDA
???
LONG ISLAND SOUND

2. Maintaining a course that will take you to the channel entrance buoy, you see a white light of another boat directly ahead of you. No other lights are visible. From the lights you can and can't see, apparently you are in what kind of a Rules of the Road situation?

____

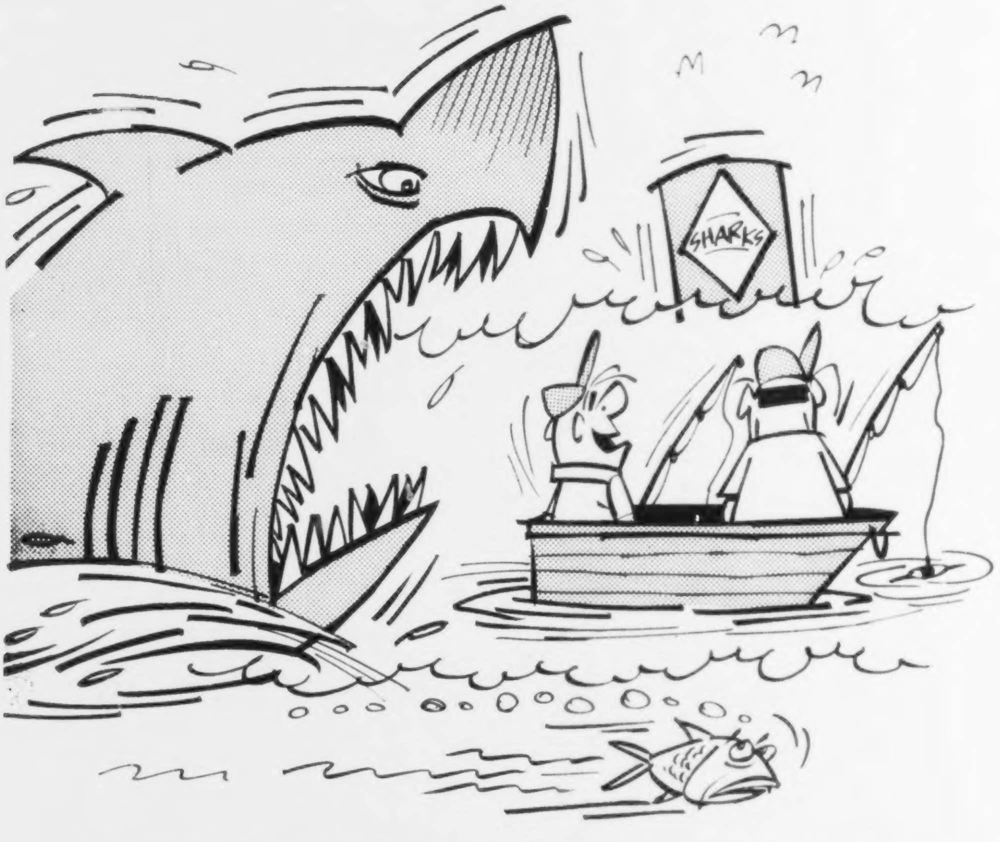
3. Since the other boat is loafing along in no great hurry, you decide to pass him on his *right* side. To find out if it is safe to do so (being the good Skipper that you are) you sound __________ blast(s) on your horn.

4. Somewhat to your surprise you hear his answer of five (5) short blasts. This is the __________ signal.

5. Apparently he can see something ahead that you can't that would make passing on his right side dangerous. So you decide to propose to pass on his left side and you sound __________ blast(s) on your horn.

6. The signal you hear him give you back indicates the left side is clear and safe to pass as you hear __________ blast(s) being returned.

7. You ease the throttle up a few notches, turn the wheel to the left, crossing his wake well clear. As you pass him well clear you can now see why his right side was dangerous. You can just make out a small rowboat with someone holding up a __________ light just off the other boat's starboard bow.



"THAT'S RIDICULOUS. I'VE NEVER SEEN ANY SHARKS AROUND HERE."

8. You're getting close to the entrance channel now as you can see shore lights off both sides of the bow. Then directly ahead you see a quick flashing green light. A quick look with the spotlight shows that it is a green buoy with a number 1 painted on it. According to what your chart says this is the channel entrance buoy and you know it must be passed with the buoy on your __________ side.

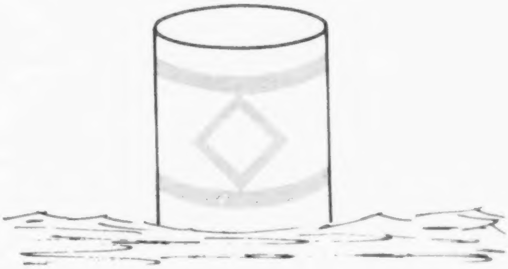
9. According to the chart the next buoy is unlighted and should be passed with the buoy on your right side. When close enough to see you note it is the correct buoy because:

   a. it is a __________ (shape) buoy.
   b. it is painted __________ .
   c. it has number __________ painted on it.

10. After a week of salt water fishing, skin diving, and boating you travel over the roads to a famous inland fresh water lake for a week of houseboating. (You sure know how to live!) You and the family decide your first trip will be up to the head of the lake to have lunch at a well-known restaurant. Leaving the marina you note that the lake is well marked with buoys in the USWM system. Up ahead just off a point of land you spot a red and white vertical striped buoy. How do you pass this buoy?

    ____

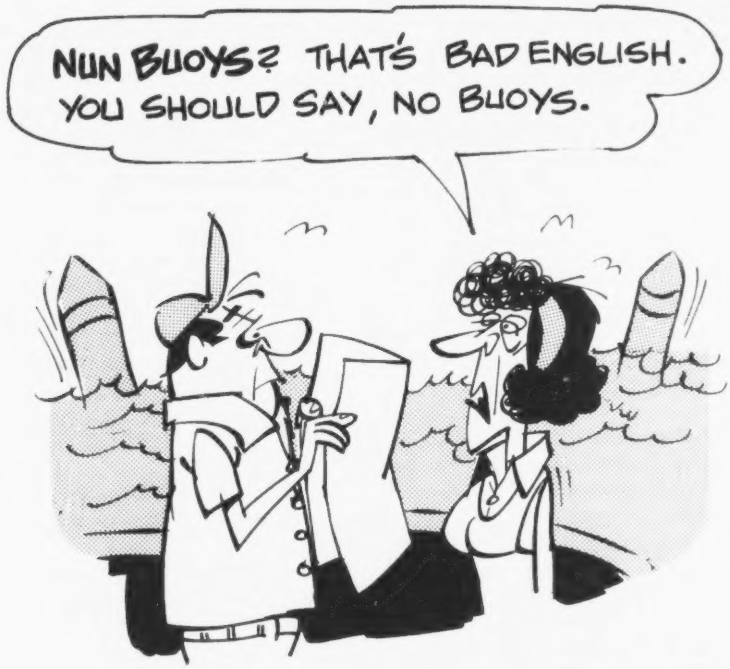
11. While traveling up the lake you see this buoy. What is the meaning of the symbol?

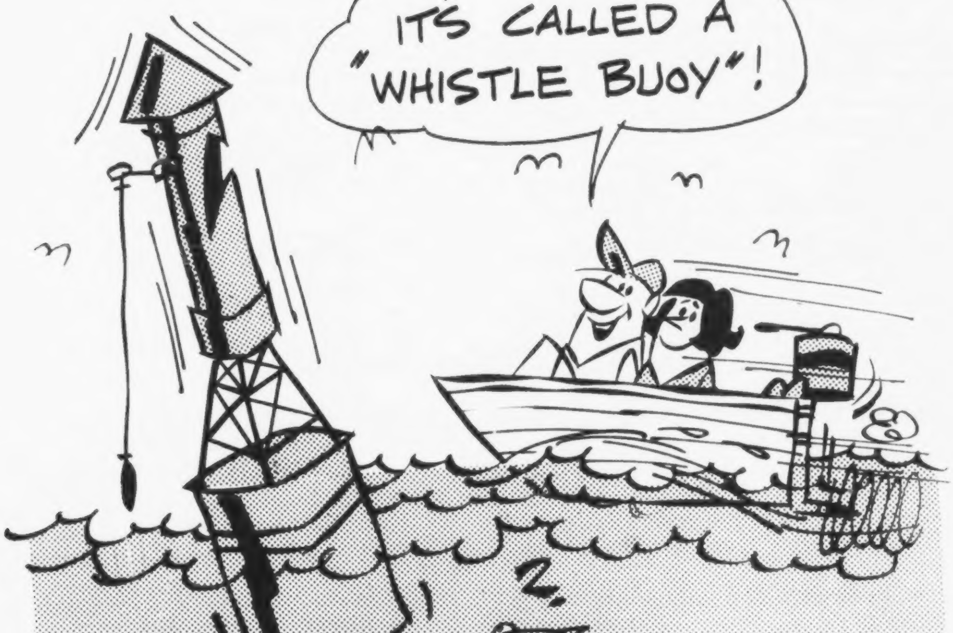


12. As you near the dock provided by the restaurant, you see a buoy with a speed zone sign on it. What is the shape of the symbol used?

    ____

WHEN ARE WE GOING TO GET THIS BELL FIXED, SIR ???


NUN BUOYS? THAT'S BAD ENGLISH. YOU SHOULD SAY, NO BUOYS.


IT'S CALLED A "WHISTLE BUOY"!

END-OF-COURSE TEST

Now that you have finished the program, you should check your knowledge. Answer the following questions (using the answer sheet on page 91) and mail in the answer sheet for grading. Read all questions carefully, and pick the **best** answer. A certificate will be issued if you pass.

1. The type of Personal Flotation Device which is specifically designed to be grasped and held by the user is:
   a. Type I
   b. Type II
   c. Type III
   d. Type IV

2. The greatest cause of fire and explosion aboard recreational boats comes from:
   a. electric galley stoves
   b. faulty electric wiring
   c. gasoline fumes in low parts of the boat
   d. fuel spilled on the deck

3. On a trailer, the difference between the Gross Trailer Weight and the Gross Axle Weight is the:
   a. tongue weight
   b. net wieght
   c. boat weight
   d. carrying capacity

4. Safe and successful trailering of boats requires:
   a. a tow vehicle of adequate size and power to tow the boat and trailer.
   b. a trailer large enough to safely carry the weight of the boat.
   c. the proper hitch to correctly mate the trailer to the tow vehicle.
   d. all of the above.

5. A GALE warning signal looks like:
   a. 1 red pennant, or a red light over a white light.
   b. 2 red pennants, or a white light over a red light.
   c. 1 red flag with a black square, or two red lights.
   d. 2 red flags with black squares, or red-white-red lights.

6. To minimize the danger of electric shock from overhanging powerlines, sailboaters should:
   a. step the mast away from overhead powerlines
   b. wear rubber soled shoes
   c. put on a PFD
   d. run a metal wire over the side

7. When aground on mud or sand, you can often get clear by:
   a. immediately shifting to reverse and attempting to back off.
   b. having passengers move and shift their weight.
   c. alternately gunning the engine ahead and reversing in an effort to "rock clear."
   d. have all passengers jump up at the same time, to reduce weight.

8. When caught out in foul weather the first thing to do is:
   a. give a proper distress signal.
   b. get everyone into a PFD.
   c. head directly back to port.
   d. drop the anchor.

9. Anchoring by the stern can be a dangerous practice because:
   a. waves may be taken over the stern, which could cause damage or swamping.
   b. the anchor line may foul the propeller.
   c. tension on the anchor line tends to pull the stern deeper into the water.
   d. all of the above.

10. When assisting a victim with First Aid, the first step to take is:
    a. treat for shock
    b. stop the bleeding
    c. check and clear the airway
    d. call for help

11. The Capacity Plate on a boat indicates the:
    a. safe passenger carrying capacity
    b. engine horsepower capacity
    c. weight of the boat
    d. both a & b

12. While helping a hypothermia victim, NEVER:
    a. wrap the victim in a blanket
    b. remove the victim's wet clothes
    c. give the victim alcohol
    d. both a & b

13. The Xiphoid Process is:
a. the Heimlich Maneuver
b. direct pressure
c. the sharp tip of the sternum
d. mouth-to-mouth resuscitation

14. The various buoy systems used are based upon:
a. the Intracoastal Waterway System.
b. the Lateral System.
c. the Uniform State Waterway Marking System.
d. the Cardinal System.

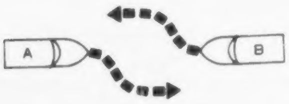
15. When underway in small open boats, PFDs should be worn by:
a. children only.
b. non-swimmers only.
c. handicapped persons.
d. everyone.

16. All trailers are required by law to display a capacity plate showing:
a. type of supports required to best transport the boat.
b. class hitch required for towing the trailer.
c. gross vehicle weight rating.
d. minimum number of tiedowns required.

17. Usually, when a boat capsizes, the safest thing to do is:
a. swim to shore.
b. make a distress signal.
c. get on or in the boat, stay with it.
d. dive under the boat and try to retrieve the cushions.

18. Most fatal accidents involving recreational boats:
a. are caused by operating at too high a speed.
b. are caused by careless fueling practices
c. are caused by overloading or improper loading.
d. are caused by operating the boat in bad weather.

19. Under Inland Rules of the Road, when two boats are meeting as shown below, boat A gives the signal:



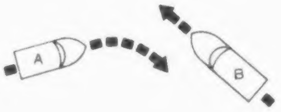
a. one blast on the horn to pass port to port.
b. two blasts on the horn to pass port to port.
c. one blast on the horn to pass starboard to starboard.
d. four blasts on the horn to pass port to port.

20. Regulatory buoys used in the USWM system can be identified:
a. by red horizontal bands at top and bottom.
b. by black bands at top and bottom.
c. by orange horizontal bands at top and bottom.
d. by their solid orange color.

21. When anchored in fog, under the Inland Rules, a vessel 12 meters or greater in length must make an audible fog signal:
a. every minute
b. every two minutes
c. every three minutes
d. not required by this size boat

22. The two basic hull designs are:
a. shallow draft and planing.
b. displacement and deep draft.
c. sailboats and powerboats.
d. displacement and planing.

23. In the situation below, boat A is said to be:
a. "stand on"
b. overtaken.
c. "give way"
d. not responsible.



24. Coast Guard approved Pyrotechnic Visual Distress Signals include:
a. hand-held red flares
b. orange smoke
c. parachute flares
d. all of the above

25. The towline on a ski boat should be at least:
a. 20 feet
b. 30 feet
c. 75 feet
d. 100 feet

26. The international morse code for distress (SOS) can be given on a flashlight or spotlight by:
   a. three long flashes, two short, three long.
   b. three short flashes, one long, three short again.
   c. three short flashes and three short flashes.
   d. three short flashes, three long, and three short again.

27. Portable fuel tanks should be filled:
   a. quickly to avoid spills.
   b. in the forward part of the boat away from the engine.
   c. outside the boat.
   d. from portable tanks.

28. Boats operating on the high seas must follow the:
   a. Inland Navigation Rules.
   b. International Navigation Rules.
   c. Geneva Convention for Safe Boating.
   d. No rules apply.

29. When approaching a dock against the wind and current in a boat under 26′, the first line to attach to the dock is:
   a. the stern line.
   b. the forward spring line.
   c. the bow line.
   d. the after spring line.

30. The rules of the road that apply to boats operating on the Mississippi River are:
   a. Inland Rules.
   b. International Rules.
   c. Individual State Rules.
   d. Geneva Convention for Safe Boating.

31. If you are meeting another boat at night head on and the other boat is under twenty-six feet in length, you would expect to see:
   a. one white light.
   b. one green light.
   c. a red and green light with white light.
   d. a red light over a green light.

32. In the USWM system, the shape of buoys:
   a. has the same meaning as the Lateral System.
   b. has no meaning.
   c. has the same meaning as the ICW System.
   d. has the same meaning as all other systems.

33. Capacity plates are mounted in a boat and:
   a. will be installed by the Coast Guard.
   b. will be installed by each new owner.
   c. will be located in plain view of the operator's position when underway.
   d. will be located near the stern.

34. Under Inland or International Navigation Rules, five or more short blasts indicate:
   a. intent to turn to port
   b. intent to turn to starboard
   c. the danger signal
   d. intent to back out of a mooring

35. When coming up to anchor, the anchor should never be thrown:
   a. because it's too heavy.
   b. because it might foul with parts of the rode.
   c. you might hit another boat with it.
   d. you might damage the anchor cleat.

36. Navigation lights on another boat observed at night:
   a. tell you its course and speed.
   b. tell you it is a class A, 1, 2, or 3 boat.
   c. tell you are meeting, crossing, or overtaking it.
   d. tell you which set of Rules of the Road to apply.

37. When returning the boat to the trailer there should be:
   a. no person in the boat.
   b. one person in the boat.
   c. one person in the boat and one in the car.
   d. one person in the boat, one on the ramp, and one in the car.

38. The daytime signal for small craft warning (winds up to 38 MPH) is:
   a. one red pennant.
   b. two red pennants.
   c. one square red flag with a black center square.
   d. two square red flags with black center squares.

39. The first thing to do when somebody falls overboard is:
   a. yell for help.
   b. Speed up the engine and turn back to where the person is in the water.
   c. slow down and turn off the engine.
   d. get something that floats into the water near the person.

40. The most important thing to do at the end of a boat trip is:
    a. plan the next trip.
    b. secure all equipment.
    c. cancel your Float Plan.
    d. wash down the boat.

41. Returning from seaward, a nun buoy:
    a. marks an obstruction.
    b. marks a channel junction and is solid red.
    c. marks the right side of the channel.
    d. is red with odd numbers.

42. After fueling, the best way to check for gas fumes in the bilges it to:
    a. hold a lighted match in front of you.
    b. shine a light in and look for distortion in the air.
    c. use your nose, and sniff all low spaces.
    d. keep a canary in a cage.

43. The class of motorboat is determined by:
    a. overall length only.
    b. overall length including outboard engines.
    c. overall length and width.
    d. overall length including rudder and bow-sprit.

44. Under Federal law, pleasure craft must be numbered:
    a. based on their class.
    b. based on their overall length.
    c. if propelled by machinery.
    d. if the motor is 10 horsepower or more.

45. The Western Rivers and Great Lakes Navigation Rules are now incorporated into the:
    a. Inland Rules
    b. International Rules
    c. Individual state rules
    d. Geneva Convention for Safe Boating

46. As a general rule, larger vessels restricted in maneuverability have the right of way over which other boats:
    a. sailboats
    b. boats fishing in the channel
    c. powerboats towing skiers
    d. all of the above

47. The arc of visibility of a stern or towing light covers ________ degrees.
    a. 225
    b. 135
    c. 112 1/2
    d. 360

48. The certificate of numbers must be kept:
    a. on board at all times.
    b. on board when the boat is underway.
    c. in the same place as a car and trailer registration.
    d. on board only when anchored or moored.

49. Wearable PFDs must be stored in the boat:
    a. near the bow.
    b. near the stern.
    c. within three feet of all non-swimmers.
    d. where they are readily accessible.

50. Navigation lights on boats are restricted to:
    a. a single color (white)
    b. two colors (red and green)
    c. three colors (red, green and white)
    d. four colors (red, green, white and yellow)

HE WENT OUT AND BOUGHT THAT UNIFORM AFTER READING "THE SKIPPER'S COURSE."

ANSWER SHEET FOR END OF COURSE TEST

Directions: Completely black out the letter corresponding to your choice with pen or pencil. When you are finished, remove this page, fold and seal it, and drop it in the nearest mail box.

1. a b c d
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3. a b c d
4. a b c d
5. a b c d
6. a b c d
7. a b c d
8. a b c d
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50. a b c d

Send Certificate to: (Type or print neatly)

Your name ____________________

Street address ____________________

City and State ____________________

(Zip Code) ____________________

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APPENDIX 1 — GLOSSARY

ABAFT	Behind.
ABEAM	Off the side, amidships.
ADRIFT	Not made fast, floating loose.
AFT	At, near, or toward the stern.
AHEAD	In front of the vessel.
AMIDSHIPS	The center of the vessel, with reference to either length or breadth.
ASTERN	Behind the vessel.
ATHWART	Across the vessel's keel line, at right angles.
BALLAST	Heavy material placed in a vessel's bottom for greater stability.
BEACON	A post or buoy placed on a shoal or bank to warn vessels of danger, or to mark a channel. Also, a signal mark on land; a light or radio signal.
BEAM	The greatest breadth of a vessel, also a horizontal support for the deck.
BEARING	The direction of one point or object with respect to another.
BELOW	Beneath the deck.
BILGE	The deepest part of ship's interior.
BINNACLE	A housing located near the ship's helm, containing the compass.
BITTER END	The inboard end of an anchor cable or line.
BITT	A perpendicular post through the deck for securing ropes and cables.
BOW	The forward part of a ship.
BROACH	The turning of a boat parallel to the waves, subjecting it to possible capsizing.
BULKHEAD	A partition or wall.
BULWARK	The side of a vessel extending above the deck.
CAST OFF	To let go a line; as to cast off a bow line.
CHOCK	A fitting to guide a line where it leaves the boat.
CLEAT	A "T" shaped fitting secured to the deck, to which lines are made fast.
COAMING	A raised section around a hatch or cockpit to prevent water from entering.
DECK	Horizontal planking resting on the deck beams of a vessel.
DOCK	A protected water area in which vessels are moored. The term is often used to denote a pier or a wharf.
DRAFT	Vertical distance from the waterline of a vessel to the lowest point of the vessel.
DROGUE	Any device streamed astern to check a vessel's speed, or to keep its stern up to the waves in a following sea.
FATHOM	A unit of length used in measuring water depth. One fathom equals 6 ft.
FENDER	A guard hung over the side of a boat to cushion contact between boat and wharf.
FID	A tapered pin used in splicing.
FLARE	The outward curve of a vessel's sides near the bow.
FOUL	Not clear; jammed.
FREEBOARD	Vertical distance from deck to waterline.
GEAR	A general name for ropes, blocks, tackle and other equipmment.
GROUND TACKLE	An anchor and anchoring gear.
GUNWALE	The part of a vessel where hull and deck meet. (Pronounced "gun'L")
HATCH	A covered opening in the deck.
HAWSER	A heavy rope or cable used for various purposes, such as towing or mooring large vessels.
HEAD	A boat's toilet. Also the upper corner of a triangular sail.

READEX FICHE

HEAVE	To throw, as to heave a line ashore; the rise and fall of a vessel in a seaway.
HEAVE TO	To bring a vessel up in a position where it will maintain little or no headway, usually with the bow into the wind or nearly so.
HEEL	A boat heels when it inclines to one side or the other.
HELM	The machinery by which a vessel is steered, including the rudder.
HULL	The main body of a vessel.
KEDGING	To move a boat in water by hauling on a line attached to an anchor.
KEEL	The backbone of a vessel from which rise the frames, stem, etc.
KNOT	A nautical mile-per-hour measure of a vessel's speed. A nautical mile is one minute of latitude, or approximately 2000 yards.
LEEWARD	Direction away from the wind.
LEEWAY	Sideward motion of a boat through the water, due to wind or current.
LIST	The inclination of a vessel to one side.
LOG	A record of courses or operation.
MAYDAY	The international spoken distress signal for radiotelephone.
PAINTER	A short piece of line secured to the bow of a dinghy for towing or making fast.
PIER	A lodging platform extending at an angle from the shore.
PLANKING	Boards used for covering the bottom, sides and deck of a vessel.
PORT	The left side of a vessel, looking forward.
PORTLIGHT	A round hinged window in a ship's cabin.
QUARTER	Either corner of a craft's stern; port quarter, starboard quarter.
RIB	Another term for frame.
SAMSON POST	A single bitt in the bow of a boat, fastened to structural members.
SCOPE	The length of an anchor line, from a vessel's bow to the anchor.
SCUPPER	An opening in a deck or cockpit permitting water to drain overboard.
SEA ANCHOR	Any device used to reduce a boat's drift before the wind.
SHEER	The vertical fore and aft curvature of the deck.
SKEG	A metal extension of the keel for protection of propeller and rudder.
STANCHION	A fixed upright post used for support.
STARBOARD	The right side of the boat, looking forward.
STEM	The foremost upright timber of a vessel to which the keel and ends of the planks are attached.
STERN	The after end of a vessel.
STRAKE	One like of planks from bow to stern.
SWAMP	To fill with water, but not settle to the bottom.
THWART	A seat or brace extending across a boat.
THWARTSHIPS	At right angles to the fore and aft line. (Athwartships)
TOPSIDES	The sides of a vessel between the waterline and the deck; sometimes referring to on or above deck.
TRANSOM	The athwartship portion of a hull at the stern.
TRIM	The fore and aft balance of a boat.
VEER	To change direction.
WAKE	The track or path a ship leaves behind when in motion.
WASH	Waves created by the passage of a moving vessel.
WAY	Movement of a vessel through the water such as headway, sternway, or leeway.
WHARF	Man-made structure bounding the edge of a dock and parallel to the shoreline, for the purpose of loading, unloading, or tying up vessels.
WINDWARD	The direction from which the wind is blowing.
YAW	To swing off course, as when due to the impact of a following sea.

APPENDIX 2 — U.S. COAST GUARD AUXILIARY

The Coast Guard Auxiliary is a volunteer, non-military organization comprised of owners of boats, aircraft and amateur radio stations. Its members receive no pay for their services.

The Auxiliary is established by law to assist the regular Coast Guard in promoting safety and efficiency in the operation of pleasure craft. To accomplish this it carries out three basic programs: Public Instruction, Courtesy Marine Examination and Operations.

U.S. COAST GUARD AUXILIARY PUBLIC EDUCATION COURSES

The U.S. Coast Guard Auxiliary offers courses in boating safety and seamanship to members of the public. The courses are taught by experienced, qualified Auxiliary members and the only charge is for Administration costs or course materials. Contact your local Auxiliary flotilla or watch for a notice in your newspaper for information. The courses offered are:

Boating Skills and Seamanship

One of the U.S. Coast Guard Auxiliary's two in-depth courses, a 13 lesson course. Included are "The Safe Way to Boating Enjoyment," "Boater's Language and Trailering," "Boat Handling," "Legal Requirements," "Rules of the Road," and "Aids to Navigation" plus "Piloting," "Marine Engines," "Marlinspike Seamanship," "Sailing," "Weather," "Radiotelephone," and "Locks and Dams." Certificates are awarded to graduates. Some Auxiliary membership requirements are satisfied by completion of this course.

Sailing and Seamanship

One of the U.S.Coast Guard Auxiliary's two in-depth courses, a 13 lesson course. Included are "What Makes a Sailboat," "How a Boat Sails," "Basic Sailboat Maneuvering," "Rigging and Boat Handling," "Weather Forecasting and Weather Sailing," "Rules of the Road," and "Sailing Seamanship" plus "Engines for Sailboats," "Tuning and Variant Rigs," "Trailer Sailing," "Equipment for You and Your Boat," "Sailboat Piloting" and "Radiotelephone." Certificates are awarded to graduates. Some Auxiliary membership requirements are satisfied by completion of this course.

Coastal Piloting

7 Lesson Course For BS&S, S&S or Similar Course Graduates.

Basic Boating

A 3 lesson course for the small boat operator.

Introduction to Sailing

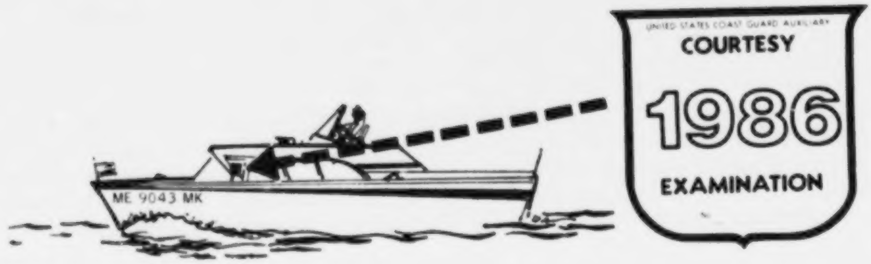
A one lesson course designed to give the novice sailor limited basic information. Its presentation time is 2 hours.

Young People's Boating Course

Geared to youths aged 10 to 15, its one hour format includes slides and demonstrations.

Water 'N' Kids

Geared to children ages 5 to 8. Course presentation time is 30 to 45 minutes.



THE COURTESY MARINE EXAMINATION--A FREE CHECK

Any owner of a pleasure motorboat which is 65 ft. or under can have his boat examined by a specially trained Auxiliary member. Upon the owner's request, the Auxiliarist will make a complete check of the boat's equipment and overall condition to see if it meets all Auxiliary safe boating requirements. If the boat passes the examination it is awarded the Auxiliary's official Courtesy Marine Examination Decal—the Seal of Safety. If it does not pass, however, the owner is advised of the deficiencies noted. No report of these deficiencies is made to any law enforcement official.

OPERATIONAL ACTIVITIES TO ASSIST THE COAST GUARD

In addition to the voluntary activities in the public instruction and Courtesy Motorboat Examination Programs, Auxiliarists participate in the patrol of regattas, and other safety patrols, and in assistance to boaters in distress. Auxiliary operations for or with the Coast Guard are always on a voluntary basis.

If you are a U.S. citizen, over 17 years of age and own at least 25% interest in a boat, aircraft or amateur radio station, you may be eligible for membership in the Coast Guard Auxiliary. Upon basic qualification, Auxiliarists are eligible for advanced training.

For further information on the Coast Guard Auxiliary and its programs contact the Auxiliary flotilla near you or write the Director of Auxiliary in the Coast Guard District where you live. (See Appendix 3).

OTHER BOATING ORGANIZATIONS

The UNITED STATES POWER SQUADRONS have long been active in the promotion of safety afloat through efforts in boating education. This voluntary, non-government organization, was founded in 1914 and now has some 70,000 members throughout the world. The USPS offers an excellent course on boating to the public. It includes such subjects as piloting, seamanship, and small boat handling.

The American National Red Cross, YMCA, Boy Scouts, and most States also offer boating courses.

APPENDIX 3 — Coast Guard District Offices

Commander (b)
First Coast Guard District
150 Causeway St.
Boston, MA 02114
617-233-3607

Commander (b)
Second Coast Guard District
430 Olive St.
St. Louis, MO 63103
314-425-5977

Commander (b)
Third Coast Guard District
Governors Island, NY 10004
212-668-7974

Commander (b)
Fifth Coast Guard District
Federal Bldg
431 Crawford St.
Portsmouth, VA 23705
804-398-9611

Commander (b)
Seventh Coast Guard District
51 S.W. First Ave.
Miami, FL 33130
305-350-4707

Commander (b)
Eighth Coast Guard District
Hale Boggs Federal Bldg.
500 Camp St.
New Orleans, LA 70130
504-589-2972

Commander (b)
Ninth Coast Guard District
1240 E. 9th St.
Cleveland, OH 44199
216-522-3995

Commander (b)
Eleventh Coast Guard District
Union Bank Bldg.
400 Oceangate Blvd.
Long Beach, CA 90822
213-590-2333

Commander (b)
Twelfth Coast District
Government Island
Alameda, CA 94501
415-536-3309

Commander (b)
Thirteenth Coast Guard District
Federal Bldg.
915 Second Ave
Seattle, WA 98174
206-442-7634

Commander (b)
Fourteenth Coast Guard District
Prince Kalanianaole Federal Bldg.
300 Ala Moana Blvd
Honolulu, HI 96850
808-546-5575

Commander (b)
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, AK 99802
907-586-7467

APPENDIX 4 — Coast Guard Directors of Auxiliary

Director of Auxiliary
803 Atlantic Ave.
Boston, MA 02210
617-233-8310

Director of Auxiliary
430 Olive St.
St. Louis, MO 63103
314-425-5971

Director of Auxiliary
4335 River Rd.
Cincinnati, OH 45204
513-684-2811

Director of Auxiliary
Federal Bldg., Room 668
Fort Snelling
St. Paul, MN 55111
612-725-3414

Director of Auxiliary
110-9th Ave. South, A935
Nashville, TN 37203
615-736-5724

Director of Auxiliary
210 N. Tucker Blvd
Room 479
St. Louis, MO 63101
314-425-4618

Director of Auxiliary
3rd Coast Guard District
Governors Island, NY 10004
212-668-7975

Director of Auxiliary
Federal Bldg., Room 204
100 Chestnut St.
Harrisburg, PA 17101
717-782-3737

Director of Auxiliary
C.G. Base Gloucester
King & Cumberland St.
Gloucester City, NJ 08030
609-456-7812

Director of Auxiliary
Federal Bldg
431 Crawford St.
Portsmouth, VA 23705
804-398-6207

Director of Auxiliary
51 S.W. First Ave.
Miami, FL. 33130
305-536-5698

Director of Auxiliary
F. Edward Hebert Bldg.
Rm. 1017
600 South St.
New Orleans, LA 70130
504-589-6629

Director of Auxiliary
1240 E. 9th St, Rm 2143
Cleveland, OH 44199
216-522-4422

Director of Auxiliary (Det).
Castle Station, Box 480
Warren & Genesee Sta.
Saginaw, MI 48606
517-753-5475

Director of Auxiliary (DET)
#1 Furman Blvd.
Buffalo, NY 14203
716-846-5185

Director of Auxiliary (DET)
C.G. Base Milwaukee
2420 S. Lincoln Memorial Dr.
Milwaukee, WI 53207
414-291-3198

Director of Auxiliary
Union Bank Bldg
400 Oceangate Blvd
Long Beach, CA 90822
213-590-2218

Director of Auxiliary
Government Island
Alameda, CA 94501
415-437-3311

Director of Auxiliary
915 Second Ave
Seattle, WA 98174
206-442-7390

Director of Auxiliary
300 Ala Moana Blvd
Honolulu, HI 96813
808-546-5575

Director of Auxiliary
P.O. Box 3-5000
Juneau, AK 99802
907-586-7467

APPENDIX 5 — State Boating Law Administrators

Director, Marine Police Division
Department of Conservation and
Natural Resources
740 Madison
Montgomery, Alabama 36130
(205) 261-3673

Technical Services Commander
Department of Public Safety
P.O. Box 6188 Annex
Anchorage, Alaska 99502
(907) 269-5694

Commissioner of Public Safety
P.O. Box 1086
Pago Pago, American Samoa 96799
(0) 633-4733

State Boating Administrator
Arizona Game and Fish Department
2222 W. Greenway Road
Phoenix, Arizona 85023
(602) 942-3000

State Boating Law Administrator
Arkansas Game and Fish Department
#2 Natural Resources Drive
Little Rock, Arkansas 72205
(501) 223-6378

Director, Department of Boating
and Waterways
1629 "S" Street
Sacramento, California 95814
(916) 445-6281

Boating Administrator
Division of Parks and Outdoor
Recreation
13787 South Highway 85
Littleton, Colorado 80125
(303) 795-6954

Director, Bureau of Law Enforcement
Department of Environmental Protection
Room 217, State Office Building
Hartford, Connecticut 06106
(203) 566-3978

Boating Administrator
Department of Natural Resources
and Environmental Control
Division of Fish and Wildlife
89 Kings Hwy
P.O. Box 1401
Dover, Delaware 19903
(302) 736-3440

Metropolitan Police Department
Harbor Section, SOD
550 Water Street, S.W.
Washington, D.C. 20024
(202) 727-4582

Boating Law Administrator
Division of Law Enforcement
3900 Commonwealth Blvd
Tallahassee, Florida 32303
(904) 487-3671

Georgia Department of Natural Resources
Law Enforcement Section, Room 711
270 Washington Street, S.W.
Atlanta, Georgia 30334
(404) 656-3510

Territory of Guam
Office of the Director
Department of Public Safety
Pedro's Plaza
287 West O'Brien Drive
Agana, Guam 96910
(0) 472-8911

State Boating Manager
Department of Transportation
79 S. Nimitz Highway
Honolulu, Hawaii 96813
(808) 548-2515

Chief, Recreation Resources Bureau
Department of Parks and Recreation
2177 Warm Springs Ave.
Statehouse Mail
Boise, Idaho 83720
(208) 334-2284

Chief, Division Law Enforcement
Department of Conservation
524 South Second
Lincoln Tower Plaza
Springfield, Illinois 62707
(217) 782-6431

State Boating Law Administrator
Department of Natural Resources
606 State Office Building
100 N. Senate Avenue
Indianapolis, Indiana 46204
(317) 232-4014

Director
Iowa Conservation Commission
Wallace State Office Building
Des Moines, Iowa 50319
(515) 281-5145

Boating Administrator
Kansas Fish & Game Commission
R.R. No. 2, Box 54A
Pratt, Kansas 67124
(316) 672-5911 Ext. 106

Dept. of Natural Resources and
Environmental Protection
Kentucky Division of Water Safety
107 Mero Street
Frankfort, Kentucky 40601
(502) 564-3074

Boating Law Administrator
Department of Wildlife & Fisheries
P.O. Box 15570
Baton Rouge, Louisiana 70895
(504) 925-4912

Director of Licensing
Department of Inland Fishing
and Wildlife
284 State Street
Augusta, Maine 04333
(207) 289-2043 FTS: 868-2043

Superintendent, Natural Resources
Police
Department of Natural Resources
Tawes State Office Building
Annapolis, Maryland 21401
(301) 269-2240

Director, Department of Marine
and Recreational Vehicles
100 Cambridge
Boston, Massachusetts 02202
(617) 727-3994

Administrator, Marine Safety Section
Law Enforcement Division
Department of Natural Resources
Steven T. Mason Building
Lansing, Michigan 48909
(517) 373-1230

State Boating Law Administrator
Department of Natural Resources
500 Lafayette Road
St. Paul, Minnesota 55146
(612) 296-3336

Boating Law Administrator
Department of Wildlife Conservation
Bureau of Fisheries and Wildlife
P.O. Box 451
Jackson, Mississippi 39205
(601) 961-5300

Commissioner
Missouri State Water Patrol
Department of Public Safety
P.O. Box 603
Jefferson City, Missouri 65102
(314) 751-3333

Enforcement Division
Department of Fish, Wildlife
and Parks
1420 East 6th Avenue
Helena, Montana 59620
(406) 444-2452

State Boating Law Administrator
State Game and Parks Commission
P.O. Box 30370
2200 North 33rd Street
Lincoln, Nebraska 68503
(402) 464-0641

Chief, Division of Enforcement
Department of Wildlife
P.O. Box 10678
Reno, Nevada 89520
(702) 789-0500

Supervisor of Navigation
Division of Safety Services
New Hampshire Department of Safety
James H. Hayes Safety Building
Hazen Drive
Concord, New Hampshire 03305
(603) 271-3336 WINTER CONCORD
(603) 293-2307 SUMMER GLENDALE
HEADQUARTERS

Chief, Boating Law Administrator
Division of State Police Headquarters
Department of Law and Public Safety
Marine Law Enforcement Bureau,
P.O. Box 7068
West Trenton, New Jersey 08625
(609) 882-2000 - ext. 530

Boating Administrator
Park & Recreation Division
Natural Resources Department
P.O. Box 1147
Santa Fe, New Mexico 87504-1147
(505) 827-7465

Director, Bureau of Marine and
Recreational Vehicles
Agency Building #1
Empire State Plaza
Albany, New York 12238
(518) 474-0446

Director of Field Operations
Wildlife Resources Commission
Archdale Building
Raleigh, North Carolina 27611
(919) 733-3391

Boat & Water Safety Coordinator
State Game and Fish Department
2121 Lovett Avenue
Bismarck, North Dakota 58505
(701) 224-2180

Chief, Division of Watercraft
Ohio Department of Natural Resources
Fountain Square
Columbus, Ohio 43224
(614) 265-6480

Director, Lake Patrol Division
Department of Public Safety
P.O. Box 11415
Oklahoma City, Oklahoma 73136
(405) 424-4011 Ext. 2143

Director, Oregon State Marine Board
3000 Market Street, N.E. #505
Salem, Oregon 97310
(503) 378-8587

Director, Bureau of Waterways
Fish Commission
3532 Walnut Street
P.O. Box 1673
Harrisburg, Pennsylvania 17105-1673
(717) 657-4539 or 657-4538

Boating Law Administrator
Maritime Department
Puerto Rico Ports Authority
GPO Box 2829
San Juan, Puerto Rico 00936
(809) 722-2409
723-2260 Ext. 315

Director of Operations
Department of Environmental Management
83 Park Street
Providence, Rhode Island 02903
(401) 277-6605

Chief, Division of Boating
Wildlife & Marine Resources Department
P.O. Box 12559
Charleston, South Carolina 29412
(803) 795-6351 Ext. 251

Boating and Hunter Safety Coordinator
Department of Game, Fish and Parks
Anderson Building
Pierre, South Dakota 57501
(605) 773-3630

Supervisor, Water Safety Law
Enforcement
Texas Parks and Wildlife Commission
4200 Smith School Road
Austin, Texas 78744
(512) 479-4850

Boating Law Administrator
Tennessee Wildlife Resources Agency
P.O. Box 40747
Nashville, Tennessee 37204
(615) 360-0522

Programs Specialist, Law Enforcement
Division of Parks and
Recreation
Department of Natural Resources
1636 W. North Temple Street
Salt Lake City, Utah 84116
(801) 533-6011

Director, Marine Division
Department of Public Safety
130 Main Street
Waterbury, Vermont 05676
(802) 244-8775

Boating Law Administrator
Department of Conservation and
Cultural Affairs
P.O. Box 4340
Charlotte Amalie, St. Thomas,
Virgin Islands 00801
(809) 775-0470 or 774-3320

Boating Law Administrator
Commission of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 257-1000

Boating Safety Coordinator
Washington State Parks & Recreation
Commission
7150 Cleanwater Lane (KY-11)
Olympia, Washington 98504
(206) 754-2166

Chief, Law Enforcement Section
Department of Natural Resources
State Office Building
1800 East Washington Street
Charleston, West Virginia 25305
(304) 348-2784

Boating Law Administrator
Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707
(608) 266-0859

Watercraft Supervisor
Game & Fish Department
5400 Bishop Blvd.
Cheyenne, Wyoming 82002
(307) 777-6974

Director, Department of Public Safety
Saipan, CM 96950
Tel: 6333/6431

APPENDIX 6 — Float Plan (sample)

1. NAME OF PERSON REPORTING AND TELEPHONE NUMBER.
2. DESCRIPTION OF BOAT. TYPE ______________ COLOR ______________
   TRIM ______________ REGISTRATION NO. ______________ LENGTH ______________
   NAME ______________ MAKE ______________
   OTHER INFO. ______________
3. PERSONS ABOARD ______________

NAME	AGE	ADDRESS & TELE. NO.

4. ENGINE TYPE ______________ H.P. ______________
   NO. OF ENGINES ______________ FUEL CAPACITY ______________
5. SURVIVAL EQUIPMENT: (CHECK AS APPROPRIATE)
   PFD's ______________ FLARES ______________ MIRROR ______________
   SMOKE SIGNALS ______________ FLASHLIGHT ______________ FOOD ______________
   PADDLES ______________ WATER ______________ OTHERS ______________
6. RADIO YES/NO TYPE ______________ FREQS. ______________
7. TRIP EXPECTATIONS: LEAVE AT ______________ (TIME)
   FROM ______________ GOING TO ______________
   EXPECT TO RETURN BY ______________ (TIME) AND IN
   NO EVENT LATER THAN ______________
8. ANY OTHER PERTINENT INFO. ______________
9. AUTOMOBILE LICENSE ______________ TYPE ______________
   TRAILER LICENSE ______________
   COLOR AND MAKE OF AUTO ______________
   WHERE PARKED ______________
10. IF NOT RETURNED BY ______________ (TIME) CALL THE
    COAST GUARD, OR ______________ (LOCAL AUTHORITY)
    TELEPHONE NUMBERS ______________

APPENDIX 7 — Answers to Quick Quizzes

Classes of Boats

1. 4 or four
2. A, 1, 2 and 3 (in any order)
3. Overall length or length
4. Class A—less than 16 feet
   Class 1—16 feet to less than 26 feet
   Class 2—26 feet to less than 40 feet
   Class 3—40 feet to 65 feet
5. a. Class 3
   b. Class 1
   c. Class A
   d. Class 2

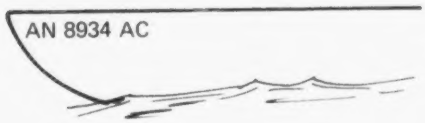
If you received a perfect score, rate yourself *Bravo Zulu* (that's Coast Guard talk for well done.) Check those that you missed and review that section.

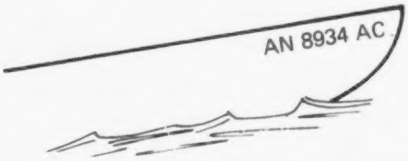
Boat Hulls

1. displacement
2. concave, convex, soft chine, . . .

Numbering

1.





2. True
3. Your Certificate of Number

PFDs

1. One wearable (Type I, II, III, or V) of appropriate size for each person, **plus** one throwable (Type IV).
2. Hit them
3. Back
4. Words "USCG Approved"
5. Children—nonswimmers
6. Accessible

Ventilation

1. Vapor
2. Ventilation
3. Intake-exhaust (in either order)
4. Heavier

Fire Extinguishers

1. One type B-1
2. One type B-1
3. Two type B-1 or One type B-II
4. Two type B-1 or One type B-II

Launching

1. Ramp
2. Holddown straps (or clamps)
3. One none
4. One
5. Emergency brake (or parking brake)

Weather

1. Weather information sources:
   Newspapers
   AM/FM radio stations
   TV stations
   Telephone to National Weather Service
2. Coast Guard Radiotelephone broadcasts on 2670 kHz
   National Weather Service Broadcasts on 162.55 MHz
   Marine Operator (Radiotelephone)
3. Storm Hurricane
   Gale Small Craft

Fueling

1. d
2. b
3. b (although all are correct, the primary reason is b)

Float plan

1. When When
   Where Who

Loading

1. Choice a is the **most** correct. Study the capacity plate (if you have one) in your boat and be guided by it.

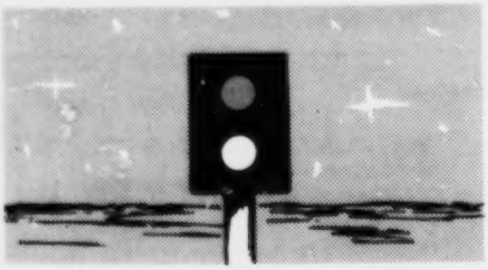
2. Choice a again. The manufacturer will mount the plate as near the operator's position as possible.

3. Choice b is correct. 20 x 6 = 120 and 120/15 = 8.

4. Choice d — Don't do it. Use your capacity plate or the formula for loading boats.

Exercise — Part II

1. Since it was still dark (the stars were out), what Charlie saw at the weather warning mast was two lights. A red light on top and a white light below like this:



   This signal means "Small Craft Warning—Winds to 38 MPH." If you got this one give yourself 20 points.

2. Charlie forgot to check and secure the boat's drain plug—20 points for this one.

3. With no breeze blowing and tied up to the fuel dock, Charlie should have aired out the boat thoroughly before telling the late Zelda Noble to start the engine—20 points.

4. Charlie filed a Float Plan alright but he failed to stick to it—a cardinal sin in boating—20 points for this one.

5. First, Zelda's zeal is putting the PFDs in the bow cuddy put them out of immediate reach. Second, a heaping pile of driftwood may have created an overloaded condition. Finally, a loose pile of driftwood could suddenly shift and cause the boat to capsize. This would be called improper loading—20 points.

   A score of 100 is outstanding!!

Operation

1. Fill out and submit an accident report.

Anchoring

1. a. life
   b. medical attention beyond first aid
   c. $200
2. Hazardous area, boats keep out
3. Skin diver, keep clear
4. Foul
5. 5 to 7

Emergencies

1. Falling overboard
2. Get something that floats in the water near the victim (or any words meaning the same thing).
3. Capsizing
4. Stay
5. a. Fuel
   b. Air
   c. Heat

Lost

1. Chart
2. Compass. Most are inexpensive. Get one and learn how to use it.

Repairs

1. a. ignition or electrical system
   b. fuel system
   c. drive train (answers in any order)
2. Shear pin
3. One third

Aground

1. depth of water (all around the boat)
2. weight
3. testing

Hypothermia/First Aid/CO

1. one half
2. 50%
3. Carotid (on the side of the throat)
4. direct pressure
5. colorless, odorless

Distress

1. Mayday, Mayday, Mayday
2. Three. (3 for night and 3 for day, or 3 day/night).
3. Raising and lowering outstretched arms

Foul Weather

1. Get everyone board into a PFD.
2. Slightly on one side of the bow or the other.

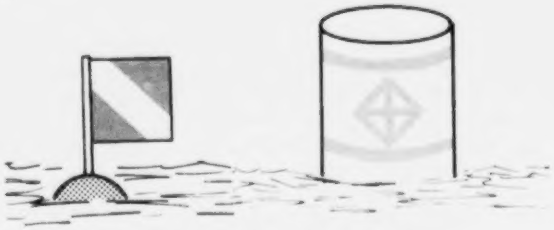
Water Activities

1. Two, the driver and the observer.
2. Is not. Never anchor to an aid to navigation or in a shipping channel.

Exercise — Part III

1. Since the property damage to Charlie's boat was in excess of $200, Irving must fill out and submit an accident report.

2.



3. Under the conditions five to seven times the depth would be OK.

4. Irving went to the bow while the boat was still in motion. He should have waited until the boat was dead in the water. Porta used too much power, in both forward and reverse.

5. Both boats were in a protected cove so Charlie persuaded Irving to stay put. He then increased the scope of his anchor line to seven times the depth and they safely rode out the brief storm.

Docking

1. Re-educate (Re-train is OK, too)
2. Ahead
3. Bow, stern
4. The exact wording of your answer isn't important if you get the idea. The point is, maintain your position if you can do it under power. Remember, only under power are you in control ! If you can't maintain position under power, go out and come back in again—make a new approach after the other boat has finished whatever he's doing.

Equipment

1. Storage, Standby (or Ready)
2. Is
3. Minimum

Exercise — Part IV

1. Charlie should have stopped dead in the water, well clear of the dock for a moment, paid full attention to wind and water conditions,—then eased into the dock with short spurts of power.
2. With the wind blowing from the stern, Charlie pointed to the stern line.
3. He should keep *both* feet in the boat and hand the gear up to the dock.
4. Charlie shouldn't have driven the boat onto the trailer—it should be winched on. Remember—the boat hasn't any brakes and Charlie could have ended up with several feet of bow sticking through the rear window.
5. No—not quite. He must now cancel his Float Plan.

Other Helpful Tips

1. friction, drag through the water
2. Hull Identification Number
3. water jacket

Rules

1. NAVIGATION RULES, International/ Inland COMDINST M16672.2A
2. Inland
3. International

Signals

1. two (2) two (2)
2. one (1) and (1) and both boats make a turn to the *right*.
3. a. give way
   b. stand on
   c. Boat A must slow down, make a turn to the right and pass well behind boat B.
   d. Boat B must maintain course and speed.
4. a. give way
   b. stand on
   c. one (1)
   d. one (1)
5. a. two (2)
   b. five (5) or more
   c. Slows down and remains behind boat B.

Lights and Shapes

1. c
2. red, green, white, amber (yellow)
3. 225°, 112.5°, 135°, 360°
4. one white light
5. a red light on your right, a green light on your left, and one or two white lights (one over the other)
6. a. crossing
   b. stand on
7. The sailboat has its motor on, and is considered a power boat under the rules.
8. a. crossing
   b. stand on

Aids

1. b. False
2. b.
3. Lateral
4. Law

Introduction to Buoys

1. a. can
   b. green
   c. odd
2. a. nun
   b. red
   c. even
3. a. lighted
   b. red, green, red and white vertical bands, red and green horizontal bands
   c. numbers or letters depending on the colors
4. sound

Lateral System

1. Left
2. Right
3. Night
4. Junctions

USWMS

1. b a
2. true
3. b
4. pairs
5. beware
6. obey
7. observe

Exercise, Part V, Aids to Navigation

1.

a.	white	135	2
b.	green	112.5	1
c.	red	112.5	1
d.	white	225	2

b. and c. may be combined in one lantern.

a. and d. may be combined in one (360°) light.

2. overtaking
3. one (1) short
4. danger
5. two (2) short
6. two (2) short
7. white
8. port (left)
9. a. nun
   b. red
   c. two (2)
10. outside the buoy—never between it and land.
11. Danger or Beware, boats keep out!
12. a circle.

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